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ASIAN PERSPECTIVES

THE BULLETIN OF THE FAR-EASTERN PREHISTORY ASSOCIATION

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Editor
WILHELM G. SOLHEIM II

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with

SPECIAL TAIWAN SECTION

K. C. CHANG, *Guest Editor*

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ASIAN PERSPECTIVES

Bulletin of the Far-Eastern Prehistory Association

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EDITORIAL

THIS seventh volume of *Asian Perspectives* for the year 1963 should be out in the first semester of 1964. In future we shall bring out the first number of each volume in its calendar year, and the second number early in the following year. This means that the reports, bibliography and financial statement should be ready for the printers by July 1.

We could solve most of our financial problems if we could count on the support of the Regional Governments and Institutions in the manner we received it this year from the Government of Sarawak and the Thomas Burke Memorial Washington State Museum, Seattle. The GOVERNMENT OF SARAWAK gave the FEPA one hundred dollars U.S. as its share towards the cost of publishing *AP*, 1963. This is in line with what the FEPA had suggested, at the time it was organized in Manila, 1955, that its budget be made good by contributions from the governments of the member countries. Late in 1961 Tom Harrisson, a member of our Finance Committee, took the first steps to implement the suggestion and our request to the Sarawak Government in 1962 was approved and budgeted for in 1963. I have written to the Council Members of FEPA to enlist a similar support of their governments for *AP* which serves their and our common interests in Far Eastern Prehistory.

The THOMAS BURKE MEMORIAL WASHINGTON STATE MUSEUM is the first Institutional member to come forward with an annual membership fee of $250. As there are about a dozen institutions in the world with similar interests, we have written them letters to invite them to become also institutional members. If our letters have not been received or if we have overlooked them, we hope they will write us for particulars.

The Department of Anthropology of the University of Hawaii and the University of Hawaii have continued to co-operate and assist us in the publication of *Asian Perspectives*. The University Research Committee of the University of Hawaii approved an allotment of $750 for a student assistant in the editing of *Asian Perspectives* for the year beginning 1 July 1963; thus Miss Elizabeth Moulder began work in July. As the Editor was to be away from the University the whole summer, Colin Smart was taken on and, in late March started to work with the Editor so that he could direct the work of Miss Moulder in the Editor's absence. The Breezewood Foundation kindly donated $150 to pay for the time Smart put in from March to July. The Editor gratefully extends thanks to the two institutions mentioned above.

Last year's financial statement needs to be amended. The total cost of printing and reprints of Volume V(i) was HK$7,614·55 instead of $5,614·55. The earnest money of HK$2,000·00 noted in item 8 (p. x) was applied to the larger total, reducing it to the $5,614·55 shown in the statement.

Account with the University of Hong Kong as of June 1963 for the Period beginning 1st January 1963

Balance brought forward from 1962	HK$2,554·23	
Income		
1. Receipts from Dr W. G. Solheim II (U.S.$2,000)	11,500·00	
2. Receipts from sales by H.K. University Press	1,890·09	HK$15,944·32
Payments		
1. Printing costs of Volume V(ii) and reprints	7,539·40	
2. Freight, brokerage, insurance, etc. on *AP* V*(ii)*	204·04	
3. Bad debt	21·25	
4. Redrawing maps	120·00	
5. Commission (25%) on sales	639·44	
6. Handling charges, postage, and insurance on copies of journal dispatched, and proofs	524·35	9,048·48
Balance in favour of Association		HK$ 6,895·84

Statement of Accounts as of 30 June 1963

(not including balance in Hong Kong)

	Credit	*Debit*
Cash on hand as of 1 January 1963, not including accounts receivable (last report)	US$ 825·82	
Money received (dues, subscriptions, gifts)	1,790·58	
Credit with Library of Congress	4·00	
Funds from sale of Volume II(ii)	39·00	
Payment to Colin Smart for editorial assistance		US$ 150·00
Postages		67·12
Brokerage and handling (Volume V, *ii*)		31·39
Payment on indebtedness on Volume II, *ii.*		39·00
Deposit to Bursar, University of Hong Kong		2,000·00
Total	US$2,659·40	US$ 2,287·71
Money on deposit with Chartered Bank, Hong Kong	HK$ 156·05	
Assets in the United States as of 1 July 1963:		
Deposits in FEPA account	US$ 367·89	
Credit with Library of Congress	4·00	
Indebtedness on Volume II, *ii.*		579·00
Total	US$ 371·89	US$ 579·00

ABBREVIATIONS

AA	*American Anthropologist.*
AE	*Australian Encyclopædia.*
AJD	*Australian Journal of Dentistry.*
AJS	*Australian Journal of Science.*
AR	*University of California, Anthropological Records.*
BAE	*Bureau of American Ethnology.*
BEFEO	*Bulletin de l'École Française d'Extrême-Orient.*
BDAA	*Bulletin of the Department of Archæology and Anthropology, Taipei, Formosa.*
BIEAS	*Bulletin of the Institute of Ethnology, Academia Sinica, Taipei.*
BMFEA	*Bulletin of the Museum of Far Eastern Antiquities.*
BSEI	*Bulletin de la Société des Études Indochinoises.*
BSEO	*Bulletin de la Société d'Études Océaniennes.*
BTLV	*Bijdragen tot de Taal-, Land- en Volkenkunde.*
FEQ	see *JAS*
FMJ	*Federation Museums Journal, Malaya.*
GR	*Geographical Review.*
IB	*Information Bulletin, Pacific Science Association.*
ILN	*Illustrated London News.*
JAOS	*Journal of the American Oriental Society.*
JAS	*Journal of Asian Studies,* formerly *FEQ: Far Eastern Quarterly.*
JEAS	*Journal of East Asiatic Studies, Manila.*
JMBRAS	*Journal of the Malayan Branch, Royal Asiatic Society.*
JPS	*Journal of the Polynesian Society.*
JRAI	*Journal of the Royal Anthropological Institute of Great Britain and Ireland.*
JSO	*Journal de la Société des Océanistes.*
JSS	*Journal of the Siam Society.*
KZ	*Kōkogaku Zasshi.*
M	*Man.*
MH	*Malaya in History.*
MJTG	*The Malayan Journal of Tropical Geography.*
MNMV	*Memoirs of the National Museum of Victoria.*
MS	*Monumenta Serica.*
NAM	*North Australian Monthly, Townsville, Queensland.*
NGS	*Nieuw Guinea Studiën.*
NZAAN	*New Zealand Archæological Association Newsletter.*
O	*Oceania.*
PEFEO	*Publications de l'École Française d'Extrême-Orient.*
PFFEPC	*Proceedings of the Fourth Far-Eastern Prehistory and the Anthropology Division of the Eighth Pacific Congresses Combined, Quezon City, Philippines.*
PIM	*Pacific Islands Monthly, Sydney.*
PJS	*Philippine Journal of Science.*
PKNAW	*Proceedings Koninklijk Nederlandsch Akademie Wetenschappen.*
SA	*Scientific American.*
SJA	*Southwestern Journal of Anthropology.*
SMJ	*Sarawak Museum Journal.*
TBG	*Tijdschrift Bataviaasch Genootschap.*
VKNAW	*Verhandelingen Koninklijk Nederlandsch Akademie Wetenschappen.*
VTLV	*Verhandelingen tot de Taal-, Land- en Volkenkunde.*
W	*Walkabout, Melbourne, Australia.*
WW	*Wen Wu* 文物.
ZMRNH	*Zoologische Mededelingen Rijksmuseum van Natuurlijke Historie.*
ZFE	*Zeitschrift für Ethnologie.*
ZVRNH	*Zoologische Verhandelingen Rijksmuseum van Natuurlijke Historie.*

I

Eastern Asia and Oceania

WILHELM G. SOLHEIM II

Whereas in previous years I tried to publish an annual report on each area, no matter how short, henceforth when the news and bibliography of an area is less than three pages, I shall briefly give its major items in my general sections and let the regional editor give the details in his next report, covering a period of two or three years.

The sectional reports for China and Japan are absent in this volume not because there is too little news, but too much. From Kwang-chih Chang, Regional Editor for the China Mainland, we hope to have a large China section in Volume VIII; in the meantime his contribution to *COWA Surveys* and Bibliographies, Far East, Area 17, No. II, 1961, should be referred to. We had planned complete translations of the annual *Archæologia Japonica*, with the support of the East-West Center, but a big cut in its budget made this impossible. The alternative would be to give abstracts of the articles in *Archæologia Japonica* with plates, maps, and line drawings that appeared in the original.

With this volume we begin to cover India, Pakistan, and Ceylon. The India section contains a brief report on activity in Nepal. In Part I we give the second report on archæological field work in the Ryūkyūs. For the Ryūkyūan specialists a limited number of both reports are reprinted and are obtainable from the Hong Kong University Press.

In Part II, the Special Formosa Section, edited by Kwang-chih Chang, while bound with Part I for members and subscribers, will also be obtainable in separate form, from the Hong Kong University Press.

Books for review should be sent to our Book Review editor Mr Colin Smart, Department of Anthropology, University of Hawaii, Honolulu 14, Hawaii, U.S.A. Henceforth a book review section will appear separate from the Reports but with cross references to the appropriate area or topical sections.

EXPEDITIONS IN THE FIELD

Under the *Pacific Area Archæology Programme* six parties are in the field sponsored by different institutions in New Zealand, Hawaii and Norway—The Bishop Museum, Honolulu, in Tahiti, The University of Auckland in Western Samoa, the Canterbury Museum in the Cook Islands and the Kon Tiki Museum in the Marquesas.

A new expedition connected with the PAAP is going into the field in November 1963. Richard Shutler of the Nevada State Museum with José Garanger of the Centre National de la Recherche Scientifique is to start field survey and excavation in New Hebrides.

Field work in Southeast Asia continues to expand. Borneo, Indonesia, and Philippines are continuously active, while a second major programme starts in Thailand. The Thai-Danish Expedition completed its field work in west-central Thailand in 1962; its final reports will begin to appear in 1964. Wilhelm G. Solheim II has received a National Science Foundation grant for a field survey in northeastern Thailand; the work is done jointly with the Fine Arts Department of Thailand. This project, begun in October 1963, is being planned for three years in an effort to salvage archæologic relics in reservoir areas which will be under water when dam construction begins in 1964 and 1965. Excavation in early historic cities in Burma continues with the first C-14 dates from one of these sites presented in this volume.

Notes from Periodicals and Institutions

Andaman Islands

Pratap Chandra Dutta has a paper on 'A trial excavation of a kitchen-midden at South Andaman' in *Wiener Völkerkundliche Mitteilungen*, 5(1962), 17–29. This site contained shell, bone, stone, iron artifacts and potsherds. It was excavated in eleven levels and in all of them pottery was found. An iron object was found on the lowest level, as well as in higher levels, and indicates that the site was recent. The crude pottery was made by coiling and decorated with incised linear designs. A brief summary of Dutta's work appeared in *Current Anthropology*, 4(4), 1963, p. 356, titled 'Recent research on kitchen-middens in the Andamans'.

Indian Ocean

'Tradewind beads once more' by W. G. N. van der Sleen appears in *Man* for August 1963, Art. No. 154, 128–129. In his brief note on glass beads found from Zanzibar to India to Indonesia the authors says that beads made in Amsterdam may be distinguished from those made in Venice by their high content of potassium compounds and little or no soda. A more detailed report on the Indian and East African beads referred to in this note is titled 'L'analisi chimica aiuta l'archeologia', *Vetro e Silicati*, 4(23), 1960, 19–24, by M. Tornati and van der Sleen.

Oceania

The Tenth Pacific Science Congress symposium volume on *Plants and the Migrations of Pacific Peoples*, edited by Jacques Barrau, 136 pp. with illustrations, has been published by the Bishop Museum Press, Honolulu, Hawaii, U.S.A., and costs $4·00 plus postage. It contains the following reports:

Introduction	*Jacques Barrau*
Movement of people and ideas across the Pacific	*George F. Carter*
Prehistoric voyages as agencies for Melanesian and South American plant and animal dispersal to Polynesia	*Thor Heyerdahl*

Vernacular plant names in Melanesia: Some examples from northern New Caledonia	*A. G. Haudricourt*
Proto-Melanesian plant names	*Ann Chowning*
Correlations of plant patterns and population migrations into the Australian New Guinea Highlands	*R. G. Robbins*
The role of Pandanus in the culture of the Marshall Islands	*Benjamin C. Stone*
Appendix: Marshallese cultivar index and distribution of the names by atoll	*Benjamin C. Stone*
The migration of rice from Mainland Southeast Asia into Indonesia	*J. E. Spencer*
Rice cultivation of the ancient Mariana Islanders	*Ichiro Yawata*
Sweet-potato variation and its relation to human migration in the Pacific	*D. E. Yen*
The origin of the sweet-potato plant	*Ichizo Nishiyama*
The Oceanian-African hypothesis and the sweet-potato	*Harold C. Conklin*

A second Pacific Science Congress symposium volume put out by the Bishop Museum Press is *Man's Place in the Island Ecosystem*, edited by F. R. Fosberg. It is obtainable from the Press for $8·00 plus postage. The papers included are:

The island ecosystem	*F. R. Fosberg*
The variety of physical environments among Pacific Islands	*William L. Thomas Jr*
The influence of the sea	*Phillip Helfrich and Sydney J. Townsley*
Nature of the land biota	*Elwood C. Zimmerman*
Biological evolution in island populations	*Theodosius Dobzhansky*
This growing second world within the world of nature	*Clarence J. Glacken*
Nature's effect on and control of man	*Marston Bates*
The effect of man on the plant world	*G. Mangenot*
Island cultures	*Andrew P. Vayda and Roy A. Rappaport*
Human influences on the ecosystems of high islands in the Tropical Pacific	*George P. Murdock*
Aspects of man's influence upon island ecosystems: alteration and control	*Roy A. Rappaport*
Nature of changes of living patterns of Pacific Island Man	*R. R. Nayacakalou*

Man's role in modifying island environments in the Southwest Pacific: with special reference to New Zealand	*Kenneth B. Cumberland*
Pressure on island environment	*Pierre Gourou*
Demographic instabilities in island ecosystems	*Irene B. Taeuber*
Islands and men	*Oscar H. K. Spate*

Man in the Pacific is a new mimeographed publication put out by the PACIFIC SCIENCE INFORMATION CENTER, Bernice P. Bishop Museum, Honolulu, Hawaii, U.S.A. In its 'Statement of Purpose' it says: '*Man in the Pacific* is a newsletter devoted to Pacific anthropological activities. It is not a new scientific journal, but an informal and informative means of communication between persons of diverse occupations and backgrounds who work with any phase of man in Polynesia, Micronesia, Melanesia, and New Guinea. The newsletter will appear as the occasion arises rather than at regular intervals, probably two to four times per year, depending on response. It will be sent to everyone listed in *Pacific Anthropologists. 1962* [see *AP* **6**, 5], those added to the list since its appearance, and to other interested individuals and institutions'. To receive this publication write and ask the Information Center for it.

The CENTRE DOCUMENTAIRE POUR L'OCÉANIE has been organized in Paris under the directorship of Jean Guiart. Its five primary activities are documentation, automatic bibliography, comparative inconography, research, and information. Documentation involves microfilming and at a later stage putting on micro cards, series of records from many sources on the Pacific. The bibliography '. . . will permit, from 1963 onwards, the analysis and coding of current papers published on Oceania, as well as tracing our steps back in the past, so as to cover, at first, all papers contained in the series of specialized publications (*Oceania*, *Journal of the Polynesian Society*, etc. . . .). This treatment of the literature bears upon texts concerned with all aspects of human sciences in Oceania, whatever they may be, printed monographs or general works, published papers, specialized literature with restricted circulation, or manuscripts, which may be made available to research workers in microfilm form'. Comparative iconography is concerned with building up an extensive collection of photographs of Oceanian art. Research of an original nature in the social sciences will be done under the auspices of the Centre. A quarterly bulletin entitled *Réalités du Pacifique*, in French and English, will carry information of its activities and publications. For further information contact Jean Guiart, Centre Documentaire pour l'Océanie, 293 av. Daumesnil, Paris XII, France.

Micronesia

A new *Journal of the College of Guam* plans to publish original research in the fields of physical and social anthropology, archæology, linguistics, systematic botany, systematic zoology, ecology, marine sciences, and related disciplines concerned primarily with Micronesia and adjacent areas of the Pacific. It will appear twice a year; its subscription rate is $3·00 per year. Address: Benjamin C. Stone, General Editor, College of Guam, Box 97, Agana, Guam.

Cook Islands

From the *Information Bulletin*, 15(4), 1963, 7–8, PACIFIC SCIENCE ASSOCIATION, it is noted that a Cook Islands library and museum is being organized and built, with locally raised funds and government support. 'The museum section of the combined building will house an historical collection covering the archæology, ethnology, and post-European history of the group. The Canterbury Museum Archæological Expedition to Rarotonga (November 1962 to January 1963), led by Dr Duff, entrusted the artifacts found or presented during the course of their work to the local museum committee after cataloguing.'

INTERNATIONAL COMMITTEE ON URGENT ANTHROPOLOGICAL RESEARCH IN NEW GUINEA

The Committee, which was organized at the Tenth Pacific Science Congress, has issued three bulletins up to March 1963. Its task may be set as follows: 'Coordinating, and stimulating field research by indicating priorities through the dissemination of information on research needs and research opportunities, on research plans and current research, on personnel available for carrying out research, and, if possible, on funds available. The Committee is not going either to sponsor or to supervise research. This is the task of the institutions and universities that bear responsibility for the work that is done, the Committee acting as an advisory body only'.

The contents of the first three bulletins was primarily concerned with research in progress. In the first bulletin a chapter was devoted to a survey of research in western New Guinea. Within this chapter was a small section entitled 'Archæology and history' (pages 23–24) from which I quote:

> Early in 1961 villagers of Kwaceware, Sentani district, found, without any real digging having been done, two artifacts of the Dongson-type on a grave-mound called Marweri Urang. A detailed description of the objects by Dr. J. V. de Bruyn (Bureau of Native Affairs) will be published in 1962 in *Nieuw Guinea Studien*. Previously, other artifacts had been found on the same spot. A report on these finds is published in *Nieuw Guinea Studien*, vol. III (1959), pp. 1–8. Thus far Marweri Urang has turned out four bronze socketed axes, two Dongson-spearheads, a brass hilt of a dagger, and a brass oil burner. Besides, native informants stated that about 1930 at least three Dongson-axes, a bronze ceremonial bell, and an artifact described as crescent-shaped, all originating from Marweri Urang, were given to a Protestant missionary who died during World War II. Nothing is known of the whereabouts of these objects. The finds include 'ear-typed' Dongson-axes such as have never been found in Indonesia but are well known from Siberia (Minusink type). The recent finds recall earlier ones such as the small, flat, and irregular pieces of metal used as amulets, and three flat, heavy, metal objects regarded as sacred, found by J. E. Elmberg in the Ayamaru district in 1957, and mentioned in *Ethnos*, vol. 24 (1959), pp. 70–80. ('Further notes on the northern Mejbrat'). A chemical analysis of these objects showed the pieces of metal to be cast of the leadcopper alloy that is typical for the Dongson bronzes; the three heavy objects were found to be tympani or bronze drums, well known from the Southeast Asian mainland.
>
> MR KARL HEIDER, of the Harvard-Peabody Expedition, discovered a number of rock paintings in the Kurulu area, which, as yet, have not been described. In a low hill near Sausapor (N.W. Vogelkop peninsula) potsherds were found which show some resemblance with the potsherds found by Cabs and Kamma near the old fortress of Jembakaki (west

New Guinea). *Cf.* Calis and Kamma in *Nieuw Guinea Studien*, 3(1958): 206–222. The Sausapor potsherds are described as decidedly finer.

'The bulletin of the *International Committee on Urgent Anthropological Research in New Guinea* is obtainable from Dr J. van Baal, Royal Tropical Institute, Department of Anthropology, Linnaeusstraat 2 A, Amsterdam-O, Netherlands. Mr Karl G. Heider writes from West Irian, Indonesia, on 30 June 1963 to say that his work in the highlands of West Irian will continue there to the end of 1963, when a big ceremony climaxes the Dani ceremonial cycle. He reports that Professor Koentjaraningrat of the University of Indonesia, Djakarta, now associated with the new Tchendrawasih University (Bird of Paradise University) established in Kota Baru Dalam (formerly Hollandia Binen), is very encouraging about the future of anthropological research in West Irian. He himself is planning an expedition to the Tor region (east of Sarmi, on the north coast). Persons interested in doing anthropological research in West Irian may write to him at Pegangsaan, Timur 42, Djakarta, Indonesia. Heider further mentions that he received a very nice carved stone, fist sized, looking very much like an embryonic churinga, from the manager of Mt. Hagen Hotel, who had dug up a number of these just outside the town of Mt. Hagen.

BOOK REVIEW

EMORY, KENNETH P. and SINOTO, YOSIHIKO

1961 *Hawaiian Archæology—Oahu Excavations*, Bernice P. Bishop Museum Special Publication 49, 77 pp., 73 figures, Bishop Museum Press, Honolulu.

This is the first published account of the recent excavations carried out in the Hawaiian Islands under the direction of Kenneth P. Emory of the Bishop Museum. (The University of Hawaii—Bishop Museum excavation programme began in 1950.) The above work is for the period 1950–1955 ('excavation' at one site began in 1938). It describes the excavation of four shelter sites, along the south coast of the island of Oahu.

First comes an account of the excavation of the four shelters—Kuliouou (site 0·1), Makaniolu (0·2), Hanauma (0·3) and Kawekiu (0·4), with notes on the composition of the deposits and the nature of the non-artifactual materials recovered; separately for each shelter. Then follows a detailed description of the artifacts from all four shelters, by functional categories of domestic implements, fishing apparatus, nets and netting implements, tools, and so on; this takes up over a half of the book.

This first account of Hawaiian excavations is a new source of important information, but its special interest is on several aspects of archæological research in Hawaii which demand close attention, particularly Emory's use of the technique of excavating by arbitrary levels (by 6-inch levels in sites 0·1, 0·2, and 0·3), and the subsequent analysis and description of the artifacts in terms of these levels and the relative sequence which results. Under certain circumstances this technique is justifiable, though they do not seem to exist in the Hawaiian shelter deposits. Indeed, the authors provide a strong argument against it in the illustration which shows the clear stratigraphy of the Kuliouou deposits (fig. 9) where intrusive disturbances are only too apparent. The description suggests that some degree of stratification of the deposits was encountered in all four shelters, with obvious disturbances in two shelters, but no attempt seems to have been made to follow these natural layers or disturbances in the excavations. From the evidence it is difficult to place much confidence in the analysis of the faunal and artifactual materials. Some items were inevitably displaced by the disturbances within the deposits and would thus clearly invalidate the sequences.

The narrow bands of shell, ash and earth which characterize the deeper Hawaiian shelter deposits present problems to the excavator; but that stratigraphic excavation is indeed possible in such deposits was recently demonstrated in the nearby Hawaii-Kai shelter (site 0·5). The ash and shell layers tend to exhibit extreme variability in thickness within a very small area, making excavation by the usual small grid square (of 3 feet side) a rather complicated technique. Possibly the excavation of a single natural layer at a time over a much wider area than usual, with the retention of narrow baulks along carefully selected lines for stratigraphic control, would solve some of the obvious difficulties. In the application of the stratigraphic technique in the local conditions, experimentation is required to some extent, but there seems little justification for the continued use of the imprecise and wasteful excavation of shelters by arbitrary levels when clear stratigraphy is present. Their comparatively shallow time depths and the fine degree of change evidenced in much of the Polynesian material demands the use of the most precise techniques available.

Another interesting aspect of Hawaiian archæology is in the presentation of the artifactual materials. They are grouped together for purposes of description and analysis, subdivided on the basis of functional categories, without any attempt to reconstruct the assemblages belonging to any specific level within a site, or even to a specific site. It is possible that certain factors justify this sort of presentation for these particular sites; it might be argued that all four shelters occur in such close proximity that their material culture might be expected to show little, if any, evidence of regional variation. This assumption demands verification for the four shelters do show a considerable gradation in the degree of their enclosure and protection (the Hanauma shelter is very exposed while the tube-like Kawekiu shelter provides an extremely well protected cavity); thus we may reasonably expect different assemblages of material due to different utilization in earlier times. Then again, as already said, in the absence of good stratigraphic control, any assemblages that might be presented would inevitably contain at least some fortuitous elements. But to argue against the use of the assemblage on this basis would make one doubt the value of any assumptions that might be drawn from the graphic sequences of fishhook material (figures 43, 44) and faunal material (figures 12, 13), which are arranged according to the arbitrary levels employed in the excavations of the deposits concerned. Even though to some extent at least, the reader may reconstruct assemblages from the evidence presented, a more complete presentation by the authors (in spite of the inherent errors the assemblages possess) would have been very valuable.

One other aspect of *Oahu Excavations*, which requires special comment, is the complete absence of any interpretation by the authors of the evidence they present. This is an unusual departure from the accepted standards of excavation reporting and nowhere did the reviewer find an explanation for this omission. The authors are in the unique position of being much more familiar with the evidence described than the reader is and surely should use their advantage by interpreting their evidence.

The appearance and general format of the book is excellent. Sinoto's clear illustrations impress the reader, but why remove the illustrations so far from their relevant text in place (figures showing fishhooks appear on pages 45 through 52 while the related discussion of this material appears on pages 48, 49, and 50) when this could have been avoided by devoting two or three consecutive pages to the illustrations without spoiling the appearance of the publication. Without doubt *Oahu Excavations* does, as the authors claim, ' . . . add considerably to our knowledge of early Hawaiian culture' (page 3). In the reviewer's opinion, however, it could have contributed more to our knowledge of early Hawaiian culture than it has in fact done. We hope that future excavation reports in the *Hawaiian Archæology* series will receive a more rigorous and thorough treatment of the archæological evidence.

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Northeast Asia

CHESTER S. CHARD

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FIELD WORK

Information now available to me on 1960 excavations in eastern Siberia is given bellow:

The Krasnoyarsk Expedition of the Institute of Archæology, under M. P. Griaznov, continued work in the area which will be flooded by the Krasnoyarsk hydroelectric barrage. The palæolithic section, headed by Z. A. Abramova, examined seven sites previously known, discovered seven new localities, and also did small-scale excavations at the sites of Tashtyk I and II. Another section of the expedition, headed by G. A. Maksimenkov, discovered twelve neolithic sites in the Truby area between Divnogorsk and Daursk. The Potroshilova section, under A. A. Gabrilova, investigated eneolithic and Afanasievo sites on the Yenisei right bank near Potroshilova village. A character of the Afanasievo grave superstructure was established for the first time: hardly noticeable circular features proved to be remains of flagstone walls. A cemetery of the second millennium A.D. was investigated at the foot of Mount Sukhanikha. The Karasuk section of the expedition, headed by M. N. Komarova, opened 76 burials of 10th–8th century B.C. in a cemetery on the Karasuk river—typical Karasuk pots, bronze knives, copper and white argillite beads, bronze bracelets, and argillite imitations of cowrie shells were found in the burials. Maksimenkov's section carried out excavations in the cemetery of Grishkin Log I which contained burials of the Bainovsk stage of the Minusinsk Kurgan culture (7th–6th centuries B.C); eleven kurgan groups were investigated. A section headed by A. V. Davydova excavated two kurgans of the 6th–5th centuries B.C. at Podgornoe lake. The Tashtyk section under E. F. Sediakina investigated remains of the Tashtyk culture on the edge of Saragash ridge: one tomb and four graves were excavated—detailed studies were made of the wooden structures and stone-grave construction, which were imitations of pit dwellings. In another cemetery L. P. Ziablin excavated two Tashtyk graves: the remains lay in a small timber structure on the floor of deep pits—vessels and fragments of plaster burial masks were found. Ziablin's section also excavated a cemetery of the Kirgiz period, Grishkin Log II, containing stone kurgans of the 6th–8th centuries A.D.

G. A. Maksimenkov made small excavations at the Ust'-Sobakinsk site, which revealed three cultural levels. Objects of the Serovo, Kitoi and Glazkovo stages of the Baikal neolithic, and of the Karasuk and contemporary Tagar cultures were found.

An expedition of the Krasnoyarsk Regional Museum under R. V. Nikolaev worked on the route of the railroad under construction between Abakan and Taishet.

Six kurgans with burials of the Tagar culture were excavated in a Minusinsk I group; and a series of Minusinsk II kurgan groups were investigated in the vicinity of Shoshino, Kochergino and Kuragino stations, as well as ancient sites at Stoiba.

Two sections of an expedition from the Institute of Archæology worked in the area which will be flooded by the Bratsk dam on the Angara river. The neolithic section under the direction of V. E. Larichev excavated in Lenkovka gorge on the bank of the Angara, near the palæolithic site of Buret'. Several neolithic objects were discovered in the lower part of the cultural deposit, and materials assignable to the iron age in the upper part. In a layer of buried soil cultural complexes of upper palæolithic age were recovered.

A second tower from the mid-17th century Russian fort at Bratsk was removed to the grounds of the Bratsk hydroelectric plant and restored by A. V. Nikitin of the Institute of Archæology. (See *Sovetskaia Arkheologiia*, 1961, 4, 281–85 for details.)

An expedition of Irkutsk University, under P. P. Khoroshikh, investigated in the Ilim hydroelectric plant reservoir area of the Ilim river valley the stretch from Zatopliaemoe to Stupinaia village. The oldest level (mesolithic) was discovered in a site near the mouth of the Tushema river; neolithic remains were also found.

The expedition of the Irkutsk Regional Museum, directed by G. I. Medvedev, continued excavations in the stratified settlement of Ust'-Belaia (Mesolithic and later).

The expedition of the Buryat Joint Scientific Research Institute, under P. B. Konovalov, made an archæological survey of the Khilok river valley (Bichurskii *aimak*) and along the Brianka, Il'ka and Cheluzhai, tributaries of the Uda river in Zaigraevsk *aimak* of the Buryat ASSR. At Bichura on the Brianka river a palæolithic site was discovered as well as other remains—in particular petroglyphs and a cemetery in Ara-Kirso gorge. Finds of neolithic and iron age materials were made along the Il'ka and Brianka rivers.

The Onon section of the Mongol Expedition from the Institute of Archæology, directed by Iu. S. Grishin, carried out archæological surveys in Kyrinsk *raion* of Chita *oblast*. Several groups of slab tombs and a series of settlements were discovered. In the Aginsk Buryat National District *(okrug)* 19 slab tombs were investigated and a bronze age settlement was excavated at Budalan village.

The Tuva Joint Expedition of the Institute of Ethnography conducted investigations on the territory of the Tuva ASSR in two sections. The first under A. D. Grach, worked mainly in Oviursk *raion;* remains of various types and periods were examined: palæolithic sites, ancient Turkish stone figures, burials of the Mangun-Taiginsk culture, kurgans of Pazyryk type, burials of ancient Turkish and later periods. Two gold belt plates were found in one of the ancient Kyrgyz kurgans in the Sagly valley. In another kurgan were fragments of birch bark with Tibetan inscriptions and pieces of Chinese silk fabrics. The second section of the expedition, under S. I. Vainshtein, continued excavations in the Kok-El' cemetery near Ishkin in Sut-Khol'sk *raion*, opening burials of different periods from the middle of the first millennium B.C. down to the 18th–19th centuries A.D.

An expedition of the Tuva Scientific Research Institute of Language, Literature and History, directed by M. Kh. Mannai-ool, excavated several kurgans in Oviursk *raion*. In the Solchursk cemetery an ancient Turkish enclosure and four kurgans were opened; one was ancient Turkish, another contained a burial of the Uiuk culture. Two kurgans were excavated in the Torgunsk cemetery, one contained an Uiuk culture burial. A kurgan near Torgalyga yielded a burial unaccompanied by grave goods; here also two walls and two stone figures were examined and a late palæolithic locality discovered with cores, blades and core tools.

In 1959 and 1960, a section of the expedition from the Yakutsk Branch of the Siberian Division of the Academy of Sciences made archæological surveys in the construction zone of the projected Viliui hydroelectric plant, under the leadership of S. A. Fedoseeva. Five burials, including that of a dog, were uncovered in a neolithic cemetery on the slopes of Tuoi-Khaia mountain. In the southern part of Tuoi-Khaia village remains of a neolithic settlement were discovered. Of particular interest is the carved figure of a moose on a flake of argillite which was found here. In the course of surveys along the banks of the Chona and Viliui six neolithic settlements were discovered and a stratified site (at Tumul village) containing neolithic and iron age levels.

On the Chukchi Peninsula, the Chukotsk section of the Northern Expedition from the Institute of Ethnography, directed by M. G. Levin and D. A. Sergeev, concluded its investigation of the ancient cemetery at Uelen, opening the remaining five burials. Under one stone superstructure was discovered a stratified complex containing four burials.

The Far Eastern Expedition of the Institute of Archæology in collaboration with the Far East Branch of the Siberian Division of the Academy of Sciences and the Khabarovsk, Komsomolsk and Blagoveshchensk Museums, under the leadership of A. P. Okladnikov, excavated a settlement of the shell-mound culture period on Peschanyi peninsula in the maritime territory. Dwellings were uncovered and a considerable amount of artifactual and faunal material found. In the Amur valley (Khabarovsk Territory) in a very ancient settlement in the vicinity of the former village of Osipovka on Mount Sun, several living complexes were identified. A cemetery of the early iron age was excavated near Naifel'd *kolkhoz* on the Bira river. Ancient material was collected in the vicinity of Konda village on the Amguni river. Excavations in the fortress on Krasnoiarovsk hill near Ussuriisk continued under the direction of M. V. Vorob'ev, a large building identified as a palace-temple structure assignable to the Jürchen (11th–12th centuries A.D.) was cleared and a type of pottery previously unknown here was discovered.

The coastal section of the expedition, headed by G. I. Andreev, discovered more than thirty new sites in Shkotovsk, Partizansk and Lazovsk *raion* of the maritime territory; the most interesting are the settlements of Sudzukhe V at the village of Temp and the one by the lighthouse in Pkhusun bay. In the upper level at the Sudzukhe III settlement, material like that found in the shell-mounds of the southern maritime culture was discovered, and in the lower level, finds reminiscent of Zaisanovka. The settlements of Valentin-Peresheek and Pkhusun existed somewhat earlier than the Zaisanovka sites and possibly at some time were contemporary with it. Several iron objects were found in the Sudzukhe V settlement; a dwelling was excavated at the Sinie Cliffs settlement; both are dated to the late Han period.

An expedition of the Far East Branch of the Siberian Division of the Academy of Sciences, under E. V. Shavkunov, made excavations in a second Buddhist temple of the Po-hai period (11th century A.D.) in the Chapigou river valley. Discoveries include roof tiles of eight types, fragments of large ceramic slabs decorated with a relief design, fragments of pottery and porcelain vessels, ceramic ornaments, statuettes of the Buddha, and a dragon head; part of the walls were covered with geometric decoration. Medieval remains in the vicinity of Ussuriisk, including those of an ancient building on the Suifun river bank and the ruins of the Zapadno-Ussuriisk *gorodishche* (fortified town site) were also examined.

No further information on 1961 field work has yet become available. For 1962, we have the following brief report of A. P. Okladnikov, now Head of the Department of History, Novosibirsk University, taken from personal correspondence. Professor Okladnikov, who visited the Altai region in the spring of 1962, discovered a post-glacial palæolithic industry with disc cores, Levallois-type cores and massive *skreblo* (large scrapers) and points. Proceeding to Outer Mongolia, the scene of much of his recent work, he again made many new discoveries. Excavations in the Shara-Khada settlement in the vicinity of Ulan-Bator revealed an industry of epi-Levallois character, datable to the upper palæolithic, and faunal remains. Visits were made again to Artsa-Bogdo mountain, Baga-Bogdo mountain and the important early site at the Sino-Mongolian frontier post of Ottson-Man't. The new material collected will give a fuller picture of the sequence of a series of palæolithic cultures in Mongolia. A palæolithic site of Siberian type with choppers and *skreblo* was also discovered at Lake Orok-Nor in the Buryat ASSR. Professor Okladnikov then transferred his operations to the Amur valley; the neolithic settlements at Blagoveshchensk revealed a pure blade culture as well as a culture of the type found at Anganghsi in Manchuria. At Kondon on Lake Evoron in the lower Amur valley a very interesting complex of ancient settlements, some stratified, were investigated again. Settlements with pottery decorated with curvilinear designs, including spirals and the so-called 'Amur woven' decoration received special attention. Vessels with a round bottom were discovered for the first time on the Amur, but are evidently of later date than the flat-bottomed wares decorated with curvilinear designs. In Okladnikov's opinion, the new vessel form may represent the infiltration of some new cultural-ethnic element from the north.

S. V. Kiselev, who died on 8 November 1962 in Moscow, was one of the leading archæologists in the Soviet Union and famous for his work in the Altai region and, more recently, in Outer Mongolia. The Institute of Ethnography of the Academy of Sciences in Moscow announces the equally premature death on 18 April 1963, of Professor M. G. Levin, an outstanding authority on the racial history and historical ethnography of Siberia. He was Deputy Director of the Institute and is known to our readers for his recent important excavations of the Uelen cemetery on the Chukchi peninsula.

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1962*a* Krasnyi IAr—Novaia Paleoliticheskaia Stoianka na Angare (Krasnyi IAr—a new palæolithic site on the Angara). *Sovetskaia Arkheologiia*, **3**: 147–156. Moscow.

Preliminary report on 1957–59 excavations in this three-level site. The middle (main) level contained 12 hearths and 23 pits, without trace of dwellings. The other levels cover limited areas and yielded few finds. Little significant time differences appear between their occupations. Although there is little basis for dating the site, it may be possibly a late descendant of Mal'ta and Buret'; actually, it resembles Talitskii's site in the Urals more than anything else in Siberia. The first instance of the use of coal as fuel in Siberia is of particular interest.

1962*b* Raskopki Paleoliticheskikh Stoianok na Rechke Tashtyk v 1960 g. (Excavations in palæolithic sites on Tashtyk creek in 1960). *Kratkie Soobshcheniia Instituta Arkheologii*, **92**: 65–70. Moscow.

This survey of the Krasnoyarsk dam reservoir area is the first systematic palæolithic research on the middle Yenisei since the pre-war period; the focus was on Tashtyk creek in the vicinity of Bateni, where two sites were tested. The finds show closest analogies to Pereselencheskii Punkt and Kokorevo I.

1962*c* *Paleoliticheskoe Iskusstvo na Territorii SSSR*. (Palæolithic art on the territory of the USSR). *Arkheologiia SSSR. Svod Arkheologicheskikh Istochnikov*, A4–3. 85 pp., 62 pls, map. Moscow-Leningrad.⁓Describes and illustrates all known examples of palæolithic art from the territory of the USSR.

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1961 Anthropologicheskie Tipy IUzhnoi Sibiri (Altae-Saianskoe Nagor'e) v Epokhi Neolita i Bronzy (Anthropological types of Southern Siberia [Altai-Sayan highlands] in the neolithic and bronze ages). *Voprosy Istorii Sibiri i Dal'nego Vostoka*, pp. 377–86. Novosibirsk. See *AP* **5**: 124.

1962 Osnovnye Etapy Istorii Antropologicheskikh Tipov Tuvy (Principal stages in the history of the Anthropological Types of Tuva). *Sovetskaia Etnografiia*, **3**: 49–58. Moscow.

Compares cranial materials collected during 1957–59 field work with those excavated by Teploukhov in 1926–29. Mongoloid and Europeoid elements were both present in the Tuva population in Scythian times, apparently without interbreeding. A new racial element of unknown origin is added in the Sarmatian period. The Mongoloid component increases in the Turkic period.

ANDREEV, G. I. and ANDREEVA, ZH. V.

1962 Raboty Pribrezhnogo Otriada Dal'ne-Vostochnoi Ekspeditsii v Primor'e v 1959 godu (Work of the coastal section of the Far Eastern Expedition in the Maritime Territory in 1959). *Kratkie Soobshcheniia Instituta Arkheologii*, **88**: 93–101. Moscow.

Survey to determine the distribution of the shell-mound culture, the neolithic Zaisanovka culture and iron age sites. Finds included a pre-Zaisanovka settlement (Zarech'e I) with all comb-ware ceramics, a proto shell-mound site (Pos'et I), and various early neolithic, shell-mound variant and iron age sites.

CHARD, CHESTER S.

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1962*a* First radiocarbon dates from the U.S.S.R. *Arctic Anthropology*, **1**(1): 84–86. Madison.

1962*b* Russian source materials for the racial history of Northern Eurasia. *Arctic Anthropology*, **1**(1): 117–125. Madison.⁓Annotated bibliography of published cranial and skeletal materials, indicating size and composition of each series.

1962*c* Proiskhozhdenie Khoziaistva Morskikh Okhotnikov Severnoi Chasti Tikhogo Okeana (Origin of the sea hunters' economy of the Northern Pacific Ocean). *Sovetskaia Etnografiia*, **5**: 94–99. Moscow. (English abstract)

CHLENOVA, N. L.

1961 Osnovnye Voprosy Proiskhozhdeniia Tagarskoi Kul'tury IUzhnoi Sibiri (Basic problems of the Tagar culture origin of Southern Siberia). *Voprosy Istorii Sibiri i Dal'nego Vostoka*, pp. 279–84. Novosibirsk.⁓See *AP* **5**: 124–25.

DEVLET, M. A.

1962 Kamennaia Figurka Andronovskogo Vremeni (A stone figurine of the Andronovo period). *Sovetskaia Arkheologiia*, **2**: 203–205. Moscow.

Describes a 1958 chance find in Bogradsk district of the Khakass Autonomous Oblast very similar to one secured by J. R. Aspelin in 1887. Discusses the stone figures of this region.

GRISHIN, IU. S.

1961 Poseleniia Epokhi Bronzy i Rannego Zheleza na Onone (Settlements of the bronze and early iron ages on the Onon river). *Voprosy Istorii Sibiri i Dal'nego Vostoka*, ppl. 317–20. Novosibirsk.⁓1958–59 reconnaissance in Chita *oblast* by the Onon section of the Mongolian Archæological Expedition.

HÄUSLER, ALEXANDER

1962 Die Grabsitten der mesolithischen und neolithischen Jäger- und Fischergruppen auf dem Gebiet der UdSSR. *Wissenschaftliche Zeitschrift der Martin-Luther-Universitat, Ges.-Sprachw.*, 11(10): 1141–1206. Halle-Wittenberg.⁓Includes most of the published data from eastern Siberia.

KAZANTSEV, A. I.

1961 Anthropologicheskie Dannye o Skeletakh iz Neoliticheskikh Pogrebenii Priangar'ia (Anthropological data on skeletons from neolithic burials in the Angara valley). *Voprosy Istorii Sibiri i Dal'nego Vostoka*, pp. 373–75. Novosibirsk.⁓Tabular data (means and range) on 13 Kitoi period crania.

KAZANTSEV, A. I. and KHOROSHIKH, P. P.

1958 Neolithicheskie Pogrebeniia v Raione Angarskoi Gidroelektrostantsii (Neolithic burials in the Area of the Angara Hydroelectric Plant). *Zapiski Irkutskogo Oblastnogo Kraevedcheskogo Muzeia*, pp. 43–50. Irkutsk.⁓Describes three burials excavated in 1953 13 km. above Irkutsk. Ascribed to terminal Kitoi and beginning of Glazkovo times.

KHLOBYSTINA, M.

1961 O Proiskhozhdenii Minusinskikh Holenchatykh Nozhei (On the origin of the Minusinsk elbow-shaped knives). *Soobshcheniia Gosudarstvennogo Ermitazha*, **21**: 44–47. Leningrad. ⁓Traced to Glazkovo compound knives of the Maikal area.

1962 *Bronzovye Nozhi Minusinskogo Kraia i Nekotorye Voprosy Razvitiia Karasukskoi Kul'tury* (Bronze knives of the Minusinsk region and certain development problems of the Karasuk Cluture). 32 pp. Leningrad.

Karasuk bronze knives on analysis shows two stages of development—early and late. Early types originated in compound knives of the early metal culture of Siberia; the later types were influenced from Trans-Baikal and Inner Mongolia, probably as a result of trade.

KHOROSHIKH, P. P.

1958 Arkheologicheskie Nakhodki v Zone Stroitel'stva Bratskoi GES (Archæological finds in the construction zone of the Bratsk hydroelectric plant). *Zapiski Irkutskogo Oblastnogo Kraevedcheskogo Muzeia*, pp. 29–42. Irkutsk.⁓1955 reconnaissance in six localities; mainly neolithic sites.

1962 Olennyi Kamen' iz Zabaikal'ia (A deer stone from Trans-Baikal). *Sovetskaia Arkheologiia*, **3**: 291–92. Moscow.

Stela with stylized deer found in 1928, 27 km. from Selenginsk. Analogous to others in Trans-Baikal assigned to early nomads of 8th–2nd centuries B.C.

KRIZHEVSKAIA, L. IA.

1961 K Voprosu o Proizvodstve Kamennykh Orudii u Neoliticheskikh Plemen Priangar'ia (Contribution to the Problem of manufacturing of stone tools by the neolithic tribes of the Angara valley). *Voprosy Istorii Sibirii i Dal'nego Vostoka*, pp. 245–54. Novosibirsk.

Workshop area at Ust'-Belaia site (1957–59 excavations) yielded apparent evidence of regular use of fire to split quartzite pebbles in tool-making.

KRYLOVA, A. A. and PAVLIUCHENKO, I. M.

1962 Orudiia Kamennogo Veka v Gornom Altae (Tools of the stone age in the High Altai). *Kratkie Soobshcheniia Instituta Arkheologii*, **92**: 61–64. Moscow.

In 1954, the 55 specimens discovered over 2 km. in the Tuekta valley are the first palæolithic data with archaic features from the High Altai. This homogeneous complex differs from other Altai finds in technique and lacks all traces of the upper palæolithic elements found in the oldest sites elsewhere in the region. Closest parallels are in East Kazakhstan and Tadjikistan.

KYZLASOV, L. R.

1962*a* Afanas 'evskie Kurgany na Rekakh Uibat i Biur' (Afanasievo kurgans on the Uibat and Biur' rivers). *Sovetskaia Arkheologiia*, **2**: 112–123. Moscow.

Describes the 1958 excavation of three very early stone kurgans in central Khakassia, dating from end of 3rd–beginning of 2nd millennium B.C. Extends the area of distribution of this culture and shows its adaptability to varied environments. Population is racially variable.

1962*b* Statuetka Severnogo Olenia iz Kanska (Figurine of a reindeer from Kansk). *Sovetskaia Arkheologiia*, 3: 299–302. Moscow.

Chance find during construction work in 1956 in an area almost unknown archæologically which lies on the forest steppe corridor between the rivers Ob and Angara. Assigned to 1st–2nd centuries A.D. Indicates that Tashtyk influence reached Kansk. Reference to all other known finds from this area.

LARICHEV, V. E.

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Demonstrates independent development of Bronze Age culture in this region, paralleling Minusinsk but not just an outpost of the latter.

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1962*a* Novoe v Izuchenii Drevneishikh Kul'tur Mongolii (New developments in the study of the oldest cultures of Mongolia). *Sovetskaia Etnografiia*, 1: 83–90. Moscow. ⌐ Extensive abstract in 'Northeast Asia' section, *AP* 6: 9–13.

1926*b* Sur la tradition paléolithique dans l'art des tribus néolithiques de la Sibérie. *VI Congrès International des Sciences Préhistoriques et Protohistoriques.Les Rapports et les informations des Archéologues de l'U.R.S.S.*

Akademiia Nauk SSSR. Institut Arkheologii. Moscow.

The art of western and east-central Siberia is realistic of hunting peoples, preserving the palæolithic tradition. Neolithic art of the Pacific coast of Siberia stems from the farming peoples of North China and is characteristically abstract and non-realistic.

OKLADNIKOV, A. P. and NEKRASOV, I. A.

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1962*a* Kul'tura Khunnov i Noinulinskie Kurgany (The culture of the Huns and the Noin-Ula kurgans). Moscow-Leningrad.

Definitive report, profusely illustrated, on the famous Noin-Ula tombs of northern Mongolia, contemporary with the Han dynasty. The author reconstructs all the aspects of Hun culture, based on the tomb materials, archæological finds in Trans-Baikal and on Chinese historical sources.

1962*b* Sibirskaia Kollektsiia Petra I (The Siberian collection of Peter the First). *Arkheologiia SSSR. Svod Arkheologicheskikh Istochnikov*, D3–9. 52 pp., 27 pls. Moscow-Leningrad.

Description of the collection of jewelry and metal work of Siberian steppe kurgans (mainly of 6th–4th centuries B.C.) which was part of the Kunstkammer of Peter the Great, with discussion of techniques, art style, motifs, and the culture-historical significance of the collection.

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1962 *Tret'ia Nauchnaia Konferentsiia po Istorii, Arkheologii i Etnografii Dal'nego Vostoka.* Vypusk II. Doklady i Soobshcheniia po Istorii Dooktiabr'skogo Perioda, Arkheologii i Etnografii Dal'nego Vostoka (Part II: Reports and Communications on the history of the Pre-Revolutionary period, Archæology and Ethnography of the Far East). Vladivostok, 1962.

Brief reports. Pertinent items: notes on Sushen, Ilou and Jurchen from Chinese sources by Larichev; early Iron Age remains of the maritime territory by Andreeva; Arsen'ev's field notes on medieval sites on the coast of the Japan sea; and bibliography of 1956–62 publications.

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3

Korea

KIM WON-YONG

Received 21 February 1963

The present report covers a period of twenty months, from May 1961 to the end of 1962, during which several prehistoric and historic sites were excavated and a long range project of research on Korean prehistory was initiated by the University of Wisconsin, who sent a team to make the preliminary survey trip.

FIELD WORK AND RESEARCH

1961

May: A prehistoric dwelling site near Seoul. A hill-top site near Susok-ri village on the northern bank of the Han river was excavated by the present reporter. It is about 10 miles east of Seoul and was discovered by Sgt. D. Chase, who briefly described it in *AP* 5, 1. Work was interrupted by the May military revolution, and was being resumed in the autumn of 1963.

The initial dig revealed five pit-houses each measuring three by four metres. They were cut horizontally into the northern slope of the hill, but erosion and illegal diggings by various visitors and villagers have since destroyed more than half of its floor area. The floor is hardened with clay, sometimes mixed with charcoal; the fireplace was not in the centre but toward a corner of the square chamber.

The associated pottery type is the plain coarse pottery of reddish-brown colour. The clay, unlike most cases with this pottery type, is rather fine and shapes include straight-sided pots with flat bottom and round pots with large, flaring mouth. Several sherds of the comb-pattern pottery and the black shiny pottery that is found around Seoul were also collected from the loose earth which fill the pit.

Among the stone implements were polished and chipped axes and adzes. The latter apparently shows an influence from the comb-pottery culture such as the Misari industry (see *AP* 5, 1) that is found on the opposite river bank of the present site. No other artifacts were collected.

October–December: An ancient cemetery in Ulssan: A Silla vase with engraved line drawing of horses, seen at a Seoul antique dealer, led to the discovery of cemetery of early Three Kingdoms' period (4–7th century A.D.) near Ulssan in southeastern Korea. Some 150 small rectangular burial pits were excavated by a team of the National Museum of Korea led by Mr Hong Sajun, Curator of its Kyongju branch. These pits, without any surface marks or mounds, lay side by side without fixed orientation within a small area on the slope of a roadside hill. Their four-sided walls were constructed with river pebbles. Numerous sherds of grey pottery together with some glass beads, comma-shaped jades, and iron objects were collected. The tombs obviously are the interim form between earlier prehistoric stone-cists and later historic rectangular pits covered with a huge earth mound. Of particular interest were several oval pots with cup-like lids, hitherto unknown.

November: Dr Erika Kaneko of the Tokyo Metropolitan University, during a two-week survey trip to Korea, visited the southern part of the peninsula around the city of Kyongju to investigate prehistoric and historic sites; she also saw the excavation site of the Soksil.

1962

March and July: Dolmens in Central Korea. Mr Kim Chongki, Assistant Curator, Department of Archæology, the National Museum of Korea, excavated twenty dolmens in Chech'on, Central Korea. In some of them, lined up along a shallow river, were found human skeletal remains, stone daggers, reddish pottery, etc. The dolmens are of the southern type, which consists of a huge rock above the ground and a subterranean stone or earth pit.

The excavation was to study regional differences in structure of Korean dolmens, and additional digs will be continued in 1963 at various places. I took part in the March excavation, and shall be co-operating again this year.

August: Archæological Survey by the University of Wisconsin. Mr and Mrs Albert Mohr, from Wisconsin, who came on a preliminary reconnaissance of several months to survey prehistoric sites and remains in Korea are the first foreign archæologists since 1945 to do field work in Korea. Their visit and a future project of the University of Wisconsin, under the supervision of Professor Chester Chard, will greatly advance studies of Korean archæology—but government regulations do not encourage full-scale archæological activities by foreigners.

October: A Neolithic cave-dwelling site discovered. On 6 October workers while bulldozing a construction site of the Catholic college in Ch'unch'on, some 50 miles east of Seoul, accidentally cut open, on a mountain slope, a prehistoric cave-chamber cut into weathered granite pan. The labourers collected three originally extended human skeletons together with five partly polished stone adzes, seven polished arrowheads, one big stone axe, one stone knife, two stone hammers, one triangular stone, one stone drill, one partly perforated tubular bead of white agate and five pots with flat bottom. The stone implements were mostly of basalt; some granite, slate and magnetite were also noticed.

When the news appeared in the next day's paper, I hurried to the site, but found everything had been removed and cleaned up. The skeletons, which had been reburied on a nearby hill, disintegrated into a heap of dust and small pieces beyond restoration.

The cave is a circular chamber with domed ceiling; its diameter was about four metres and two metres high. A thick layer of shiny soot still adheres to the ceiling. Traces of a fireplace could be noticed toward the entrances; the workmen said they found the artifacts around it. According to them, the skeletons lay with their feet extended toward the centre of the chamber.

The stone adzes, of local basalt, clearly follow the tradition of the flake industry characteristic to the so-called comb-pattern pottery culture of the west coast. The arrowheads of flat elongated-triangular shape are connected with similar arrowheads of the west coast comb-pottery culture. The huge flat granite axe, however, is of the northeastern Korea type.

The very interesting potteries are made of clayey earth without tempering and baked rather hard, ranging in colour from whitish brown to dark brown. Except for one pot, these oval-shaped flat-bottomed vessels all have a band of pits or imprinted short vertical lines around the mouth. This is certainly the so-called 'mouth-rim decoration' of a typical comb-pottery of the west coast. Flat bottom and plain body without decoration are characteristic of northeastern comb-pottery. Thus, the Kyodong culture (a term I have proposed from the name of the area where the cave is) is a hybrid of two different cultures of east and west, meeting here by the Han river and belongs probably to the end of the neolithic period around the fifth or sixth century B.C. (See my report, A prehistoric cave dwelling site at Kyodong, Ch'unch'on, Central Korea, in *Korean Historical Review* **20**, in press.)

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This second monograph on Korean prehistory which follows the author's *Studies on Korean Stone Daggers* (1959), is a detailed study of Korean comb-pattern pottery based on materials and data known prior to 1945. Two new comb-pottery sites discovered in the north Korea recently come in an appendix. Like in his previous work, the author sums up and publishes here the archæological data gathered by Japanese scholars during their field work in Korea down to 1945. Although limited in some sense, this is a major contribution on Korean prehistory.

Kim Won-Yong 金元龍

1962*a* Dolmens in Korea (in English). *Journal of Social Sciences and Humanities (Bulletin of the Korean Research Center)* **16:** 1–11. A brief survey of their general character, origin and date, etc.

1962*b* Amsari eui sokki t'ogi 岩寺里의石器土器 (Stone implements and pottery of Amsari site) *Korean Historical Review* **17, 18:** 355–383.

Amsari, on the southern Han river bank, is a type site of Korean comb-pottery culture. This study of the Amsari culture is based on materials in the National Museum of Korea and the University Museum of Seoul National University. The original site, which was first exposed and then washed away in the great 1925 flood, has never been reported, though it produced the richest and most typical examples of Korean comb-pottery. In this article, the author makes for the first time a claim for the presence of 'Black pottery' in Korea. The Amsari black pottery in its vessel shape and texture recalls specimens from the Kurokawa pottery (southern Kyūshū, Japan. Late Jōmon).

Mikami Tsugio 三上次男

1961 *Mansen genshi humbo no kenkyu* 滿鮮原始墳墓の研究 (The dolmens and stone cists in Manchuria and Korea). In Japanese 697 pp., + 18 pp. of English. Yoshikawa Kobunkan. Tokyo, Japan.

Prof. Mikami, Tokyo University, though not a field archæologist but a historian, made a painstaking effort to collect all the known data in order to define the character, date and distribution of dolmens and stone cists in southern Manchuria and Korea. His great work has brought to light not only the character of the burial systems but also the society which they characterize. His thorough bibliography is of particular value.

4

Hong Kong

S. G. DAVIS

Received 14 May 1963

Throughout the year the Archæological Team of the University (and unfortunately a large number of free lance enthusiasts with varying competence) continued archæological field work.

A preliminary report by M. W. Welch (1962) described middle age neolithic finds from three new sites on the small island of Kau Sai Chau in Rocky Harbour. A wide variety of patterned pottery of the 'hard' type and polished stone adzes similar to other finds reported elsewhere in Hong Kong were collected. All three sites are located about 30 to 50 metres above sea level. Some of the adzes are made of stone different from the Rocky Harbour volcanics that form Kau Sai Chau and so were brought to the island from elsewhere. It has been suggested that their place of origin was Vietnam.

Much publicity was given to a discovery in March 1962 on the reservoir site at Shek Pik, Lantau Island (Fig. 1), of copper coins and pottery. This find was brought

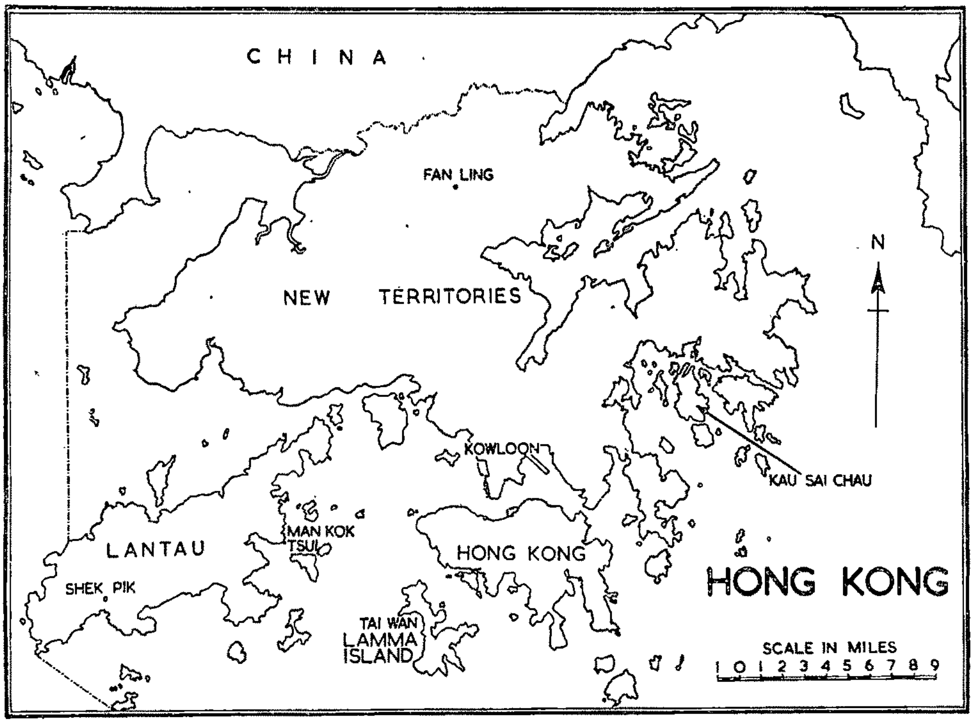


FIG. 1. Hong Kong.

to light by the large earth moving and bulldozing machines that were levelling the floor of the reservoir. The coins are clearly dated and range in age from A.D. 713 to 1226, (T'ang dynasty to Sung). The richly glazed potsherds are of vessels, which if whole, would be of priceless value today.

These finds come from poor farming land, until recently malarial and with no nearby natural resources of economic value. They might have been the property of a rich man (or party) who was possibly in transit or resting, or as has been suggested was the property of the court of the boy Sung emperor, Ti Cheng. In A.D. 1277 when the Mongols were extending their control over China, Ti Cheng in his flight stayed for some time in Kowloon City. Later he crossed the mouth of the Canton river over to Chung Shan, and thus probably travelled along the southern shore of Lantau Island, going ashore for food and rest.

In 1954 when the Shek Pik area was being surveyed for a reservoir, the University Team was first to do archæological work there by trenching across the sandy raised beach, where in 1938, Professor W. Schofield reported artifacts. During the work a rock-carving behind the beach was found about 200 yards from the seashore on the east side of the valley. It was cleaned up and later in 1958 had a protecting wall built round it (Pl. I*a–b*).

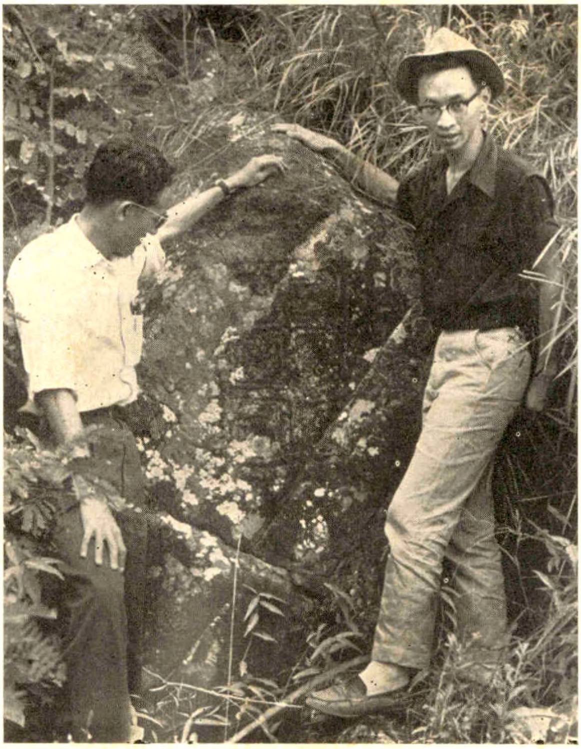
Local legend and history had it that there was another rock carving in the valley. A search on the west side of the valley was unrewarding and it was assumed that if it originally was there it had been obliterated by weathering and erosion. During Christmas 1962 the spur in the middle of the valley, at about 400 feet, was explored. On a prominent rock the second carving was found (Pl. I*c*).

The most recent find was in May 1963 when farmers digging a well near Fanling struck a cache of coins. Some date back to the T'ang dynasty while others are Sung. So far over 500 coins have been collected by the farmers who presumably offer them for sale.

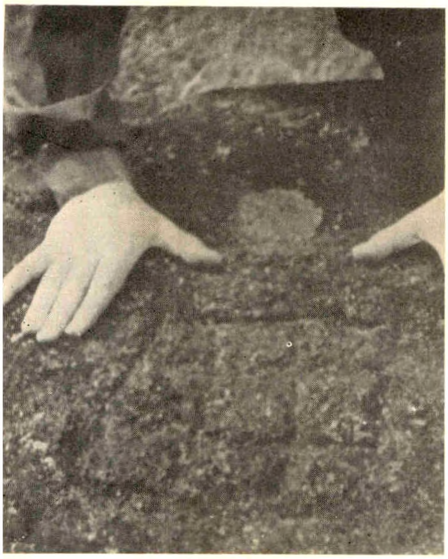
A much needed ordinance controlling archæological sites and exploration is about to be passed by the Legislative Council of the Hong Kong Government. This is urgently needed because enthusiastic amateur archæologists often dig indiscriminately and their finds are lost and neither reported nor described.

Many fine specimens have left Hong Kong; some have fortunately found their way into overseas museums. In the Bishop Museum in Honolulu there is half a pot, nearly 3 feet in diameter from a site near Fanling. [A check was made at the Bishop Museum. A number of large stoneware sherds with a fine crossed relief on the outside and reputed to be the lower portion of one vessel were located as well as several boxes with stone artifacts. We shall attempt to have a report on this material for the next news issue. ED.] Harvard University is said to have received specimens during the year. Many other finds have been sold to private collectors and are lost.

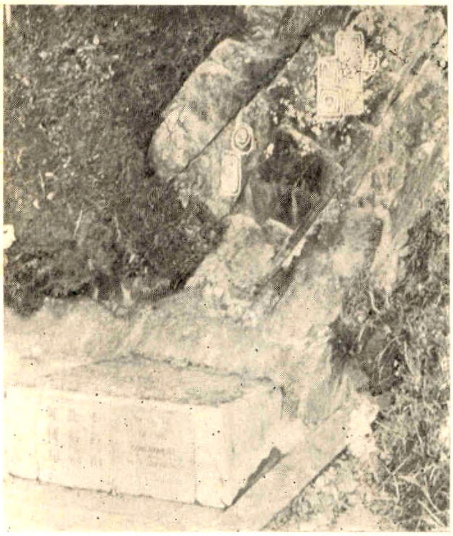
Two permanent homes in Hong Kong for local archæological treasures are now being planned. One is in the new City Hall and the other in Fung Ping Shan Museum in the University of Hong Kong. The Fung Ping Shan Museum has a workroom suitable for cataloguing, repairing, making rubbings, photography and other practical work. It is further proposed to set aside duplicates for exchange purposes.



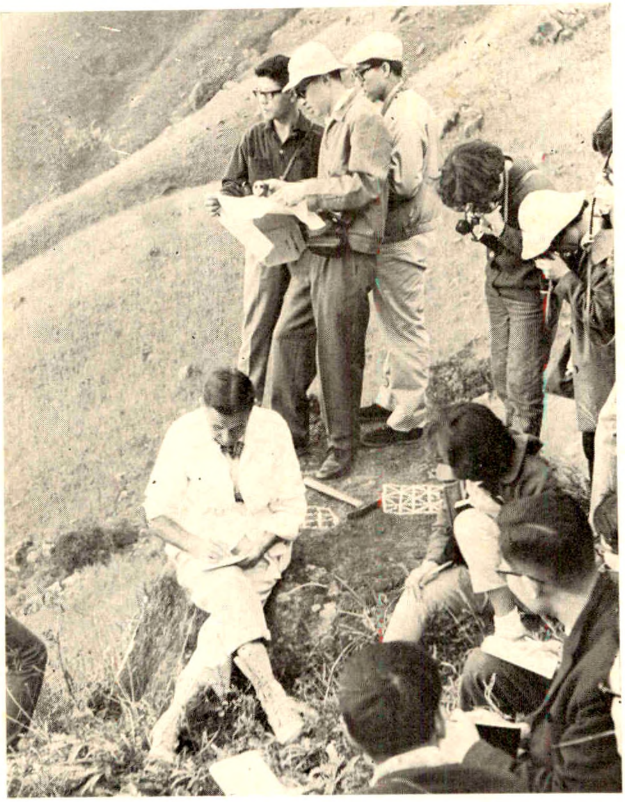
a. Rock carving at Shek Pik.



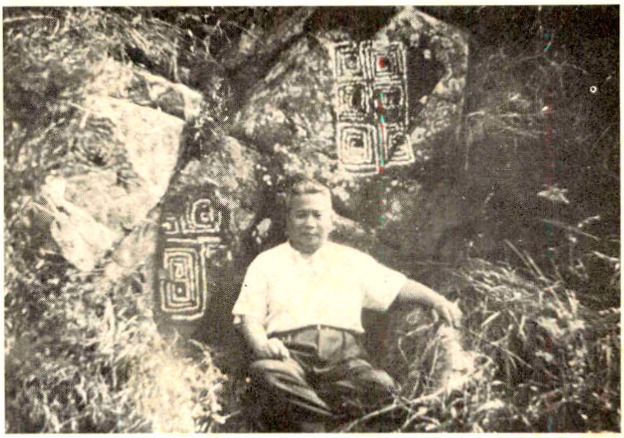
b. Rock carving at Shek Pik on a spur at 400 feet.



c. Inscription reads: 'By Order of Government. These carvings must not be defaced'.



a. Rock carving on spur above Shek Pik Reservoir discovered Christmas 1962.



b. Rock carving at Shek Pik at sea level.

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274106

5

Union of Burma

U AUNG THAW

Received 14 March 1963

Field Work and Research

Peikthanomyo. The department resumed the scientific excavation at Peikthanomyo during the open season of the year. Regular work at the site during the three preceding seasons had produced reliable evidences of the antiquity of Peikthanomyo which was vaguely known in traditional account and legendary history. The discovery of massive brick structures, the palace complex, the burial urns, pottery and other small but important cultural objects now give us a fair perspective of the city. It is so vast that large scale excavation of the whole area is not feasible or even necessary; but much can still be done to define its cultural characteristics within the framework of the Burma's past cultures and their chronological sequences.

In a more intensive study of the mounds within the fortified city, this year's excavation was devoted to two mounds near the northern wall and a third one standing squarely on that wall. At the first mound, numbered 11, was exposed the ruins of a rectangular brick structure measuring 88 by 48 feet. The four walls, which have a uniform width of 4 feet, stand freely on the ground level and now remain to a height of 16 courses of bricks. On plan it resembles the structure uncovered previously at mound No. 9. The inner sides of the walls have square vertical slots at regular intervals to accommodate wooden posts. Within the enclosing walls there is a high brick platform with a base roughly 17 feet square; it rises to about 4 feet in three receding stages. The higher parts of the walls, the windows or openings, if any, and the superstructure of the building had suffered complete damage and its original design is lost to us. Its plan, however, is clear and is reminiscent of the vaulted type of temples of early Pagan with an obelisk in the centre which supports the spire. Traces of an earlier occupation of the site are also detected. Stratigraphical evidence in relation to the remains of charred wooden ports within the building indicate that a wooden structure had preceded the monument now exposed. The whole structure is enclosed by a brick retaining ridge 1½ feet in width. From this site, within and outside the structure, nine intact burial urns were recovered similar to those found at mound No. 9, but no other minor antiquities save a few fragments of terracotta bangles. The nature of the brickwork and the presence of clay urns of exquisite design indicate that the brick structure on site 11 is a part of the homogeneous cultural activity of the ancient city.

The buried brick structure at site No. 12 represents an altogether different type of architecture from those so far brought to light within the city. It is square on plan, each side measuring 34 feet, with a stepped projection on the east side approximately 12 feet square. Traces of an opening exist on the south wall but the structure does not seem to be originally the hollow type. The walls now stand at a height of about 4 feet, with elaborate designs on the exterior. The lowest six courses of bricks are laid flat in the usual manner resting on the ground level. Over the top course is a taller course of bricks on edges, with upper ends rounded smoothly and uniformly. The next course (which was indented so as to show the curved moulding below) is the usual flat layer. The overlying course comprises two types of bricks placed alternately on their edges. The first type has a gadrooned end, the upper part of which being smaller than the bottom part and a little retracted. The second type is the common plain brick which is indented between the decorated bricks. The pattern thus formed is a series of protruding beaded bricks interspersed with small recesses. This course is topped by another flat course and the decorative pattern is repeated in succeeding layers. Eighty burial urns were recovered around the structure. Close to the projection on the east was found a skeleton which looked flexed and cramped. This is the first unusual instance of the discovery of a human skeleton within the city. Mingled with clayey soil it demands an experienced anthropologist to give restorative treatment and record its features. While this might help future research on the subject, for the time being, this only sample is too meagre to establish its racial affinities.

The position, size and shape of mound No. 13 (the third site excavated this season) suggest that the brick fortification was strengthened by two or three bastions on each side. The excavation showed that the debris was formed by the crumbling walls of the gateway which has a pair of arms extending inwards to a distance of 80 and 86 feet respectively on the east and west sides. These arms or ramparts do not turn at right angles to the main wall but bend gradually southward to form the gateway (20 feet wide) and a long passage. An iron socket and the remains of a burnt wooden door were found in the process of excavation. It may be surmized that similar mounds at other points on the fort walls mark the entrances into the city.

While the mounds of Old Prome yielded numerous terracotta votive tablets and relics, at Peikthanomyo they were void of any religious object; this presupposes that the site is pre-Buddhistic.

The sample of charcoal from site 9 which was analysed by Isotopes Inc., New Jersey, U.S.A. for C-14, shows that the site is about 2,000 years old; this would place the culture of Peikthanomyo within the chronological framework of the early history of Burma. Three more charcoal samples from different locations in Peikthano have been dated by the Institute of Nuclear Sciences, New Zealand, at approximately 1720, 1810 and 1970 B.P., not far removed from the first result. All samples are from burned wooden posts within the brick structures.

Excavation of five more mounds in the area is in progress at the time of writing.

Pagan. A test excavation was carried out at the site of Paunggu pagoda, south of Pagan. It is on the top of a high cliff on the Irrawaddy west bank about one-half mile due west of the Myazedi at Myinpagan. The erosion of the bank had worn away more than half of the monument leaving only a small mound barely 20 feet high; a vertical section of the bank exposes the brick core of the structure. This pagoda is recorded as the find-spot of some stone plaques with fine sculpture in relief, which in 1915 were deposited in Pagan Museum. As the remaining ruins of the pagoda will perish sooner or later, the mound was excavated to salvage any important antiquity that might be found. Digging was confined to its southern portion to expose the base of the stupa and the foundations of another structure close to it on the east. The latter is a hollow rectangular building with a sanctum at the western end containing a square pedestal. No niches for stone sculptures were found at the base of the stupa to our disappointment. However, our efforts were partly rewarded by the discovery of a clay votive tablet bearing five figures of the Buddha and two lines in old Mon writing recording the donor's offer of the tablet.

Halin. This old city site in Shwebo district was explored during the year to guide systematic excavations in the next field season. Despite the dry climate of the area the brick walls of the city, rectangular on plan, have decayed so badly that long stretches could hardly be made out on the ground level. Halin is a well-known ancient site in Upper Burma; and the earlier discoveries here of two Pyu inscriptions, a stone sculpture and numerous symbolical coins confirm its cultural link with Old Prome. But further field work is needed for fuller information of its structural remains and related cultural data. Apart from its historic remains, the site abounds with neolithic objects. Surface collections were made of fragments of ringstones, and one jade ringstone in good condition, found by a lad south of Halin village, was acquired for the department. A detailed survey and mapping of the site to facilitate excavation is being undertaken and digging at one site within the city has commenced.

EPIGRAPHY

With the revision of the Mon Inscriptions of Burma completed, the compilation of the text and translation went to press before the end of the year. It will be the first publication of the entire collection of Mon epigraphs in Burma, with the exception of the Kalyani Inscription of Dhammazedi. Our epigraphic section has continued its transliteration of Burmese inscriptions and has dealt with over 150 epigraphs during the year. Five new inscriptions were recorded. To have a complete record of all the mural inscriptions of the Pagan temples for further publication and research, the work of surveying their interior was begun and over seventy monuments were inventoried before the close of the year. The legends describing the 550 Jataka scenes on the walls of the Shinbin Sagyo temple at Sale were placed on record in the course of exploring the area.

CONSERVATION OF ANCIENT MONUMENTS

The ancient monuments maintained by this department got special and annual repairs. Within the budget allotment of K75,000 for conservation works in different localities the expenditure incurred was as follows:

Pagan	K23,173	Monywa	K 3,352
Hmawza	16,253	Tada-u	3,146
Mandalay	7,762	Pegu	2,609
Mrohaung	6,570	Twante	363
Peikthano	4,975	Ava	314
Amarapura . . .	4,451	(Miscellaneous charges) .	1,415

At Pagan, repairs were carried out particularly at the Setana pagoda which was recently put on the list of scheduled monuments. It was built by Htilominlo, and is one of the largest solid stupas in Pagan. To preserve the structure the repairs began with the basement and the removal of large quantities of debris from four terraces. The Thandawgya, a colossal Buddha image of hewn stones within the city of Pagan, which stood open to the air for many years, has now a vaulted roof over the brick chamber; it is now properly protected against the ravages of weather for centuries to come. Major repairs were made to the Somingyi pagoda and the Gudawthit temple. The Ajagona, Thinganyon and Asawkywan temples near Minnanthu got a fair share of the funds for their preservation. A labour gang for about three months carried out annual repairs on several monuments in need of immediate attention.

Maintenance repairs were made on the *pyatthats* (wooden pavilions) on the fort walls at Mandalay, for the first time since the war; and steps were taken to restore the severely shattered masonry walls at an initial cost of three lakhs. Inside the fort, the clock tower east of the palace platform was restored to its original height short of the wooden superstructure. Annual repairs were executed at the Atumashi monastery and King Mindon's tomb.

Conservation work at Hmawza was confined to the Bawbawgyi, one of the oldest monuments of Burma which still retains its original form. The bricks on the cylindrical body of this pagoda had decayed so much that large patches of its surface, a couple or more feet in thickness, had gradually fallen down. Special repairs were undertaken during the year at a cost of K16,253, to arrest further deterioration and remedy the state of long neglect. The work is not yet completed and a substantial sum is provided to continue the work in the ensuing year.

Four new inscription sheds, two at Salingyi in Monywa district, one at Payagyi village and one on the Shwemawdaw Pagoda platform at Pegu were constructed for the preservation of lithic inscriptions *in situ*. At Amarapura a masonry shed was built to shelter the Gugyi pagoda inscription.

The brick structures exposed by archæological excavation at Peikthano received needed attention. Conservation works at Twante, Tada-u and Ava were of the nature of maintenance repairs. All the above works were undertaken departmentally by the Conservation section.

GENERAL

A new field museum building at Hmawza (Old Prome) was constructed at a cost of K35,000 which was funded by the Cultural Council. It has exhibition space for about a hundred selected specimens of stone and terracotta objects collected on the site since the inception of the department. The old building within the compound of the Kyaukka Thein monastery continues to serve as a storehouse for numerous votive tablets and a shelter for huge stone sculptures preserved *in situ*.

Experimental work in the chemical treatment of wall paintings in the Pagan temples was continued with success. For the proper conservation of the murals a UNESCO expert was invited to observe their condition in different stages of decay and report on the suitable means to effect their preservation. One of his recommendations is that a technical section and workshop be set up at Pagan to carry out the project to save these national treasures—this will take many years. The first step to send a chemist to Belgium, for training in scientific methods of preserving murals and art objects, was taken before the end of the year.

Our photographic section took over one thousand photographs during the year. They include the details of the excavation work at Peikthano, the recording of architectural features and antiquities at various sites and the copying of rubbing of inscriptions. Forty measured drawings were made of the exposed structures and pottery from the three sites excavated at Peikthano. Line drawings of architectural motifs at the Pagan temples were also executed and copies were made of 19 Jataka scenes from Kubyauk-Gyi temple at Pagan and a score of similar scenes from Shinbin Sagyo at Sale.

The Annual Reports of the Director for 1958–59 and 1959–60, and U Mya's votive tablets of Burma, Part II, dealing with Srikshetra tablets were published during the year.

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6

India

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INTRODUCTION

This is a brief review of the more important archæological discoveries made in India, or by Indian archæologists abroad, in the field year 1961–62, that is between April 1961 and March 1962.

As stated in the résumé covering the decade 1951–1960 (pp. 144–159), several institutions and universities as well as the Archæological Departments of quite a few State Governments are actively engaged in field work, in addition to the Archæological Survey of India—the Central and biggest archæological organization in the country. The yearly output, thus, is quite enormous, and it would be well nigh impossible to deal here individually even with the more important ones of the explorations and excavations carried out in the country. It is therefore best to take a collective view of them, classifying the results under three heads, the Stone Ages, the Protohistoric Period and Historical Archæology.

In this summary arrangement, I depart from my decade-résumé, by referring, as far as possible, to individual excavators and institutions. Following the section on Explorations, Excavations, etc., are two others, Indian Archæological Expeditions Abroad and The Archæological Survey becomes a Centenarian. Next year the reader may expect a separate summary of Carbon-14 determinations of certain important archæological sites in the country.

EXPLORATIONS, EXCAVATIONS AND OTHER IMPORTANT DISCOVERIES

The Stone Ages

Year in and year out the field worker is adding to the list of sites of known types, but a discovery becomes significant only when some new area is involved or fresh and revealing observations are made regarding stratigraphy, etc. Thus, while many new sites have come to light relating to Early, Middle and Late Stone Ages of the country, the more significant discoveries are the following.

In the districts of Kangra in Panjab and Bilaspur in Himachal Pradesh, the Exploration Branch of the Archæological Survey of India (the latter hereafter referred to as the Survey), under the guidance of Shri V. D. Krishnaswami, explored an area of about 165 square kilometres, most of which will be under water with the completion of the Govind Sagar Dam (popularly known as the Bhakra Dam) on the Sutlej. A large number of tools of the Gulerian (Sohan?) complex came to light, comprising mostly unifacial 'choppers' and, to some extent, bifacial 'chopping tools' (Fig. 1). No hand-axe or cleaver (typical of the 'Madrasian' industry) was found at any of the explored sites. At each of the sites of Alsu, Dahar and old Bilaspur, a series of three terraces was observed, tools being associated with two of them.

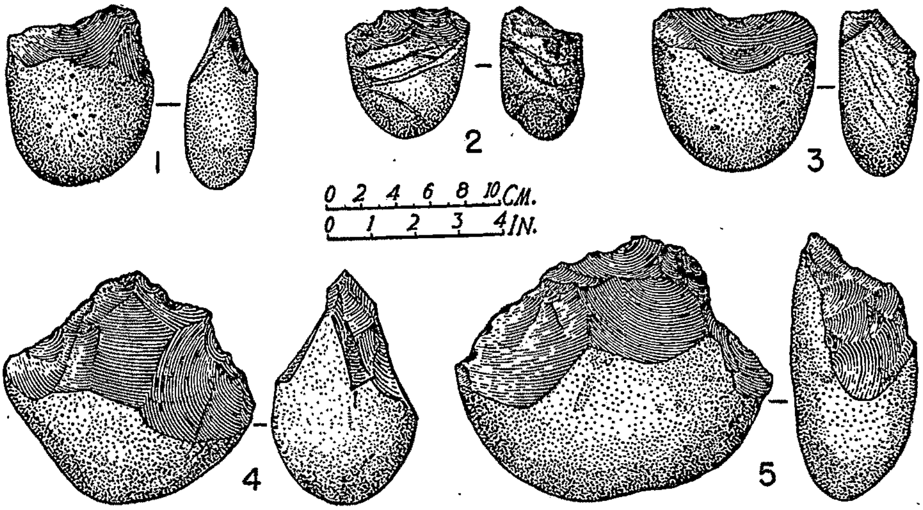

FIG. 1. BILASPUR. 'Chopper-chopping' tools.

Professor H. D. Sankalia and his colleagues of the Deccan College Post-graduate and Research Institute, Poona, excavated an 'open' Early Stone Age site at Lalitpur, District Jhansi, Uttar Pradesh. Two localities were taken up and a stratified sequence was noted from top downwards, with granite as the bed-rock. The artifacts included, besides bifacial hand-axes, cleavers and cores, a very large number of waste flakes indicating that the localities were possibly factory sites.

In the Singhbhum District of Bihar, the valleys of the Subarnarekha, Sanjay, etc., were explored by the Department of Anthropology of the Calcutta University, under the direction of Shri D. Sen. At various localities were discovered, *in situ:* Early Stone Age tools comprising Abbevillian to Acheulian hand-axes; microliths of various types; and polished stone axes, chisels, pounders, etc. The University also carried out explorations in the Bankura and Midnapur Districts of West Bengal, bringing to light several Early Stone Age sites, in addition to those explored earlier by Shri V. D. Krishnaswami. In the Midnapur District, some of the tools were found embedded in laterite according to the report.

Under a scheme sponsored by the Council of Scientific and Industrial Research, Dr A. P. Khatri examined the Pleistocene deposits of the upper Narmada, between Bhera Ghat and Hoshangabad, and collected a large number of mammalian fossils including *Bos bubalus*, *Cervus*, *Elephas antiquus (namadicus)*, *Elephas indicus*, *Equus*, *Hippopotamus*, *Sus*, etc.; some were found *in situ* and associated with lithic industries.

In the lower reaches of the Narmada, between Chandod and the sea, Dr G. J. Wainwright, Shri K. T. M. Hegde and Shri S. C. Malik of the M. S. University, Baroda, carried out an intensive exploration and collected Stone Age tools from well-stratified deposits; they also attempted a correlation between the latter (i.e. the implementiferous deposits) and ancient sea-levels.

Shri P. C. Pant and others of the Banaras Hindu University explored a large area in Banda District, Uttar Pradesh, bringing to light sites of Early, Middle and Late Stone Ages, besides those with neoliths. An example of a polished stone axe, from a site called Lodhwara, is particularly interesting as it has two small 'pits' on either side (Pl. I*a*).

The Vindyan region, lying to the south of Banda, is equally rich in prehistoric remains. Thus in two districts in Madhya Pradesh, by Shri S. R. Rao (of the Survey) in Rewa and Shri K. P. Jadia (an independent worker) in Panna, were located several rock-shelters with paintings (Pl. I*b*); some also contained microliths.

Shri B. K. Thapar of the Excavations Branch of the Survey excavated an open-air microlithic station at Kuchai in Mayurbhanj District, Orissa. The lowest excavated deposit consisted of lateritic gravel bereft of any tool (Fig. 2). Above it was a layer of gravel mixed with greyish earth and loose lateritic pellets. It yielded non-geometric microliths, i.e. blades, points, scrapers, lunates, etc.; there were no triangle or trapeze forms, nor was any pottery associated with the tools. In the next higher layer—a clayey deposit lying unconformably over the preceding one—were polished stone axes of the usual eastern variety in association with a coarse brownish-red ware, occasionally slipped and incised; the association of this ware with the neoliths (which had been surmised earlier on the basis of mere surface explorations) was thus confirmed. The dig also provided further proof, if indeed such were still needed, of the comparatively high antiquity of the non-geometric microlithic industry.

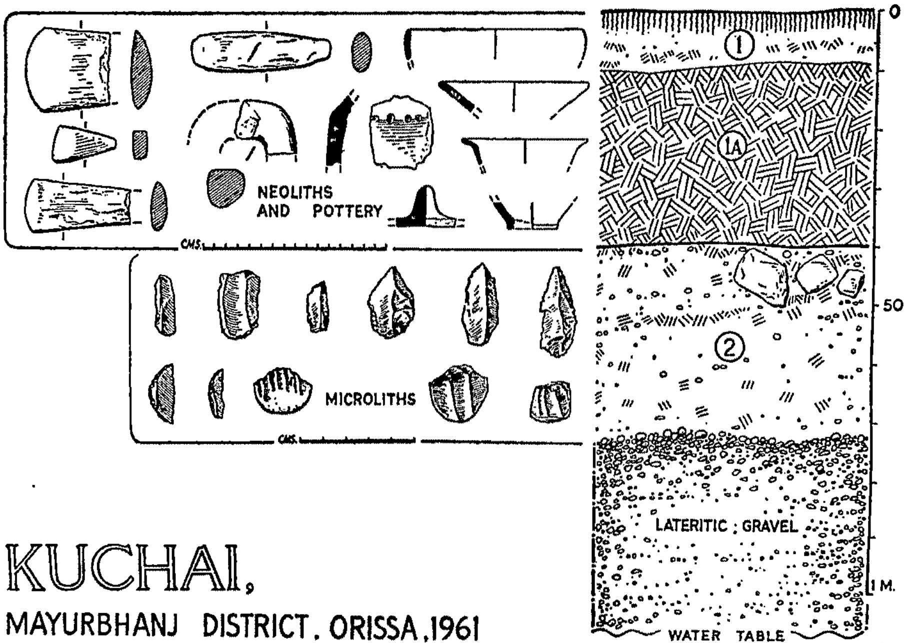

FIG. 2. KUCHAI. Culture-sequence.

The Protohistoric Period

At Kalibangan, Ganganagar District, Rajasthan, the excavation I carried out during the preceding year had brought to light, from the lower levels of the larger of the two mounds, a black-painted (sometimes augmented with white) pinkish-to-red ware which in its totality was quite different from the classical Harappan ware. This year, the work, continued by Shri B. K. Thapar of the Excavations Branch of the Survey, brought to light, in the lower levels of the smaller mound, not only many more details of the pre-Harappan ceramic industry but also well laid-out structures associated with it (Pl. II*a*). Several structures belonging to Harappan levels were excavated, including the remains of two arterial streets. Amongst the finds in the Harappan levels, was a terracotta bull (Pl. II*b*), reminiscent of the one found years ago at Mohenjo-daro.

Continuing his work at Lothal, Ahmadabad District, Gujarat, (another Harappan site currently under excavation). Shri S. R. Rao of the Survey completely exposed the dockyard (Pl. II*c*), in the bed of which were also found five perforated anchor stones. Details were also obtained of the channel which connected the dockyard with the ancient course of the neighbouring Bhagavo river. A further study of the habitational strata and of the pottery and antiquities found in them confirmed that there was no break of occupation between Phases A and B at the site, the latter being nothing but a devolved phase of the Harappan Culture itself.

Ahar, the type-site of the protohistoric culture going by that name in Udaipur District, Rajasthan, had partly been excavated for two seasons, during 1954–56, by Shri R. C. Agrawal of the Department of Archæology, Government of Rajasthan. Its excavation was resumed this year under the joint auspices of the Deccan College Post-graduate and Research Institute, Poona, Department of Archæology, Government of Rajasthan and the University of Melbourne; the respective team-heads were Professor H. D. Sankalia, acting as overall director, Shri R. C. Agrawal and Dr William Culican.

The excavation confirmed an earlier observation that there were two cultural periods at the site; the earlier one associated with the white-painted black-and-red ware (Pl. III*a*), characteristic of the Ahar Culture, and the later with the historical Northern Black Polished (N.B.P.) and allied wares, with a clear-cut gap in between them. On the basis of pottery-variations, Period I was further divisible into three sub-periods, each with four to five structural phases. The houses were made of wattle-and-daub or of stone rubble-and-mud. The presence, in some of the houses, of large-sized hearths having up to four units (Pl. III*b*) is of interest. Iron was absent even from the topmost level of the Period. Amongst the small finds were terracotta spindle-whorls or beads bearing incised decorations, which seem to resemble, outside India, those from Troy and Anau.

Professor K. D. Bajpai, of the University of Saugor, continuing his excavation at Eran in Sagar District, Madhya Pradesh, brought to light much evidence of the four distinct periods observed there earlier. From bottom upwards, Period I was characterized by microliths and black-on-red ware; there were also a few sherds of the white-painted black-and-red ware typical of the Ahar Culture. A big mud wall—perhaps a fortification-wall—also seemed to be of this Period. Period II, marked by the disappearance of the earlier materials except plain black-and-red ware, yielded thick grey ware, punch-marked and tribal coins and iron objects. Amongst the finds of Period III, was a hoard of 3,268 punch-marked coins, and also in its upper levels Red Polished Ware. Ascribable to Period IV was a fortification-wall of massive stones.

The excavation at Pandu-rajar-dhibi in Burdwan District, West Bengal, by Shri P. C. Dasgupta of the State Archæological Department, has brought to light, from the lower levels of the site, black-on-red and white-painted black-and-red wares (Fig. 3) which had never previously been noted in that region. Though much further investigation is necessary, it is quite possible these wares are connected with their respective prototypes in central India and Rajasthan.

Of polished stone axe (neolithic) cultures, something has already been mentioned in the preceding section, for the concerned sites had also yielded artifacts of the Early, Middle or Late Stone Age. As, however, no neolithic cultures in India are known to be earlier than the Harappa Culture, which is conventionally placed under the 'Protohistoric Period', they are also dealt with under this head.

To recall, the excavation at Kuchai (p. 29) showed the association of a brownish-red ware with the eastern variety of polished stone axes. As the tools and the ware are quite different from their respective counterparts in the Southern and North-western Neolithic Cultures, the separate entity of the Eastern Neolithic Culture is now duly established.

Of the Southern Neolithic Culture, a few sites were excavated this year. The excavation at T. Narasipur, Mysore District, was resumed by Professor M. Seshadri, on behalf of the State Department of Archæology. Within the neolithic culture, the pottery-sequence seems to have been, from bottom upwards: hand-made, coarse burnished grey ware and a cream-colour ware; coarse as well as fine burnished grey wares; and addition of painted black-on-red ware. It confirms earlier observations, made at other sites as well, that the painted black-on-red ware is an intrusive element in the southern neolithic complex. The dig also brought to light an extended burial of the Southern Neolithic Culture. In the upper strata of the site were profuse quantities of the Megalithic Black-and-red Ware with graffiti.

Shri T. N. Khazanchi of the Survey continued his excavation at the type-site of the North-western Neolithic Culture, viz. Burzahom, near Srinagar, Kashmir. The excavation, besides confirming the stratigraphic sequence of four periods identified earlier, brought to light much new material, particularly of Periods I and II, both ascribable to the Neolithic Culture. Of Period I, 16 dwelling-pits were exposed; the largest was about 2½ metres at the top, 4½ metres at the bottom and 4 metres in depth, with provision for landing-steps in its upper part. On the ground-level were hearths made up with odd stones. By Period II, the dwelling-pits seem to have gone into disuse, there being, instead, wattle-and-daub structures, as suggested by the presence of a series of post-holes. During both periods, the pottery comprised a burnished grey ware, though somewhat coarser in the earlier. In Period II, a burnished black ware, often with characteristic mat-impressions on the exterior of the disc-base, was also in use. Polished stone axes, harvesters, rings, etc. (Pl. III*c*) and bone tools comprising points, awls, chisels, harpoons and needles characterized both periods, the frequency and finish of bone tools, however, being

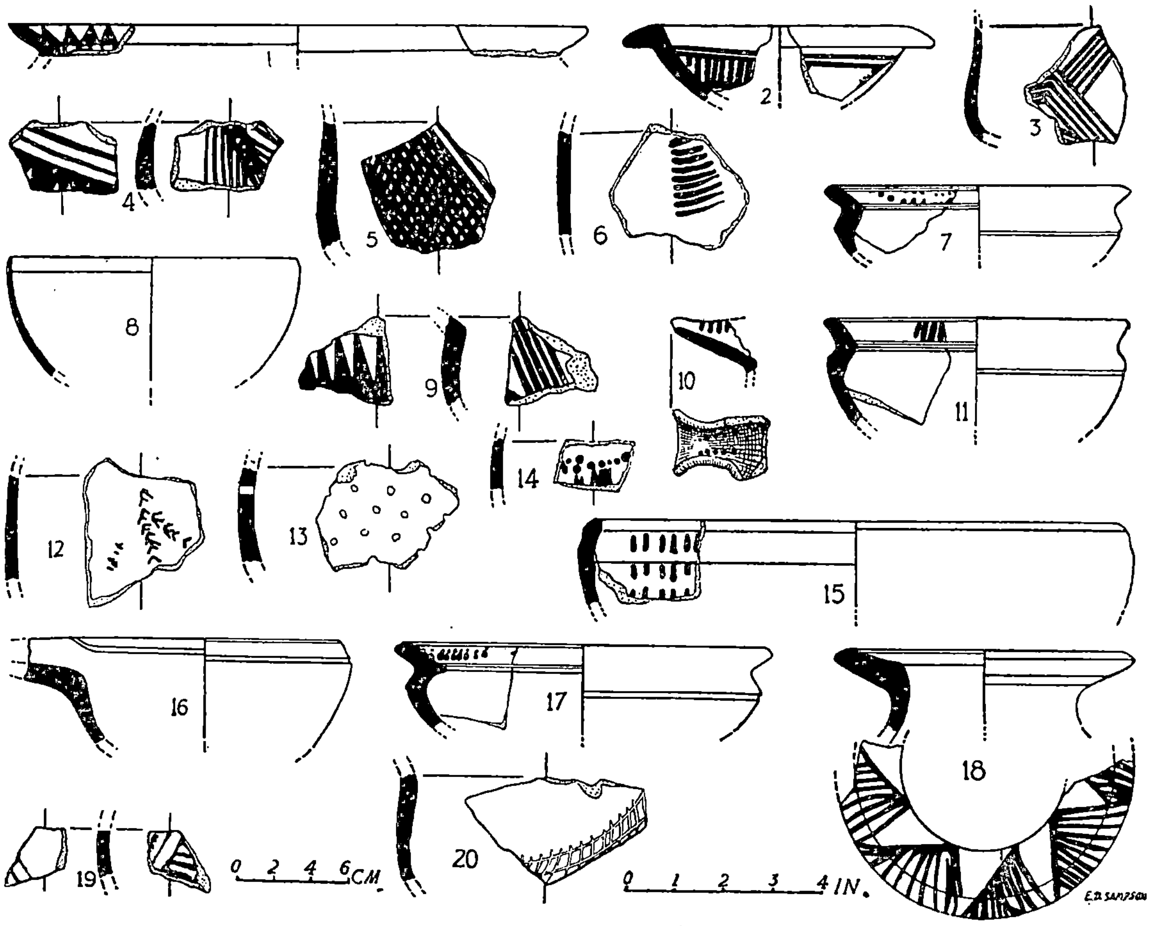

FIG. 3. PANDU-RAJAR-DHIBI. Early pottery.

greater in Period II. In Period III were found structures of stone rubble and also 'megaliths' whose exact function remains to be determined. Period IV, characterized by a red ware industry, is ascribable to *circa* A.D. 3rd to 4th centuries.

Historical Archæology

Many sites ascribable to the early historical times (i.e. from about the middle of the first millennium B.C.) have been excavated.

In the GANGA VALLEY, Professor G. R. Sharma of the Allahabad University continued his excavation in the palace area at Kausambi, Allahabad District, Uttar Pradesh. The horizontal dig exposed a good bit of the plan of the palace; stratigraphically, its earliest phase (there were three phases in all) appears to be anterior to the Northern Black Polished Ware, with which in the main it was contemporary. Thus, the palace may go back prior to the middle of the first millennium B.C.

The University also discovered, at Hathinia, Varanasi District, U.P., many stone circles with cairn-packing, simulating the megaliths, with which, however, a detailed comparison will be possible only after excavations.

In the same district, the University of Banaras, under Professor A. K. Narain, continued its excavation at Rajghat, and brought to light two phases of the clay rampart that enclosed this site of ancient Varanasi; traces of a moat around it were also observed.

South of the Ganga, at Ahraura, in Mirzapur District, a rock-inscription of Emperor Asoka (Pl. IV*a*) was discovered.

North of the Ganga, in Gorakhpur District, U.P., the University of Gorakhpur, under Professor G. C. Pande and Shri S. N. Chaturvedi, excavated the site of Sohagaura. It has four cultural periods. From bottom upwards, Period I was characterized by grey, black and black-and-red wares; there were also painted specimens in each case. Period II had the N.B.P. Ware, while Period III post-dated it, yielding, besides a red ware, typical Sunga terracottas and coins ranging from those of the Ayodhya and Panchala dynasties to the Kushans. The latest Period, IV, was datable to medieval times.

In BIHAR, four sites were excavated: Antichak, Bhagalpur District, by Professor B. P. Sinha and Dr R. C. P. Singh of the Patna University; Sonpur, Gaya District, by Dr B. S. Verma; Vaisali, Muzaffarpur District, by Shri Sita Ram Roy of the K. P. Jayaswal Research Institute; and Rajgir, Patna District, by Shri Raghbir Singh of the Survey.

At Antichak, a massive brick structure, probably a *stūpa* with chambers and antechambers, was excavated. Amongst the many finds were a bronze image of Tārā and a stone Buddha in the Pāla style.

The work at Sonpur confirmed the earlier findings of three cultural periods, with a subdivision in the first. This subperiod I A contained a coarse black-and-red ware and a few objects of bone, while in I B the ware was finer. Period II was noted for the N.B.P. Ware and iron, and amongst others a terracotta figurine (Pl. V*a*). In Period III, both the N.B.P. and black-and-red wares were in disuse, and a red ware industry made its appearance.

At Vaisali, the two excavated sub-sites, Baniya and Virpur, confirmed the usual pre- to post-N.B.P. Ware sequence of the region.

At Rajgir, excavation was done at the new fort, supposedly founded by Ajatasatru, the Magadhan king at the time of Buddha. Although its occupation more or less synchronized with the appearance of the N.B.P. Ware, the defences, as encountered in the excavation, seem to be a bit later; they consisted of a mud rampart having a base nearly 40 metres wide and revetted externally by a slightly tapering burnt-brick wall. An encircling moat was also evident.

In the deltaic region of the Ganga, in District 24-Parganas of West Bengal, work was continued at Chandraketugarh by Shri K. G. Goswami of the Calcutta University. Eight occupational periods were identified, the earliest yielding grey ware and the N.B.P. Ware and the latest associated with a small-sized temple of ninth–tenth centuries A.D. Of interest was the occurrence, in Period VI, of Rouletted Ware, which is usually thought to be due to Indo-Roman contacts around the Christian era.

In GUJARAT three excavations deserve mention: at Nagal, Broach District, by Shri K. V. Soundararajan of the Survey; and at Devnimori and Shamlaji, both in Sabarkantha District, by the late Professor B. Subbarao of the M.S. University of Baroda.

The excavation at Nagal revealed, besides faint traces of a chalcolithic culture, a good picture of the evolution of the black-and-red ware industry.

At Devnimori, more details of the Buddhist monastic settlement were obtained. Beginning in the second century A.D., the complex comprised a simple *stūpa* and *vihāra*. In the fourth century, finely-moulded façades were added to the structures, with images, whose decorative elements show Gandhara affinities. The complex seems to have come to a close about the sixth century.

The Shamlaji excavation brought to light a town site complementary to the monastic complex of Devnimori. A noteworthy feature, was the presence of burnt-brick fortifications, even now 10 metres high. Numismatic and other evidence showed that the township at Shamlaji outlived the Devnimori complex by several centuries.

A hoard of 278 images of bronze and marble (Pl. IV*b*) was found in an underground cell of a Jain temple at Ghogha, Bhavnagar District. These images, with 3 Buddhist exceptions, belong to the Jain faith; the inscriptions on some of them, are datable from eleventh to sixteenth century A.D.

In MAHARASHTRA, two noteworthy excavations were undertaken: at Kaundanpur, Amraoti District, by Dr M. G. Dikshit of Nagpur University; and at Junapani, Nagpur District, by Shri B. K. Thapar of the Survey.

At Kaundanpur, identified with Kaundinyapura (according to tradition the famous capital of ancient Vidarbha mentioned in the Epics), the earliest of its six cultural periods yielded black-and-red and grit-tempered wares. The N.B.P. Ware and punch-marked coins appeared in Period III, while IV yielded the Russet-coated Painted Ware and Satavahana coins. Period V showed a late phase of the Satavahana age. With a break from the preceding ones, Period VI yielded medieval remains.

At Junapani, three megaliths, all of the cairn-circle type, were excavated. They revealed fragmentary human skeletal remains, in association with Black-and-red and grit-tempered wares and profusion of iron objects. The site marks a northerly extension of the megaliths, otherwise typical of South India.

In ANDHRA PRADESH, the State Archæological Department, under Shri Abdul Waheed Khan, continued the excavation at Yeleswaram, and brought to light megalithic burials, the remains of a stepped bathing *ghāt* on the Krishna, and a huge *mandapa*-complex, ranging in date from a few centuries before to a few centuries after the Christian era.

In Krishna District, Shri H. Sarkar of the Survey carried out an excavation at Kesarapalli. Four cultural periods were identified; the earliest may perhaps go back to the late neolithic times. Period II, however, yielded the usual Megalithic Black-and-red Ware, iron objects, etc. Period III yielded the Rouletted Ware, and IV the Ikshvaku coins.

In the State of MADRAS, the site of Tirukkambuliyur, Tiruchchirappalli District, was excavated by the University of Madras. The remains of a culture associated essentially with Black-and-red and Russet-coated Painted Wares (the latter showing both wavy and rectilinear designs) were brought to light.

ARCHÆOLOGICAL EXPEDITIONS ABROAD

In 1956, almost half-a-century after the famous expeditions of Sir Aurel Stein to central Asia, an Indian exploratory expedition visited Afghanistan. The year 1961–62 saw a further renewal of the external activities of Indian archæologists. This year three expeditions were sent out, one to Egypt and two to Nepal. As Egypt is outside of the area covered by *Asian Perspectives*, it is not given here.

Nepal

The Director General of Archæology in India, Shri A. Ghosh, visited Nepal in May 1960 to advise its Government on archæological matters, as the result of a request received through the Indian Aid Mission in Nepal. Two archæological expeditions were sent to Nepal during 1961–62 in partial fulfilment of his recommendation.

The expedition led by Dr R. V. Joshi of the Survey was entrusted with the exploration of the Katmandu Valley for possible Stone Age remains. It found no Stone Age tool—be it palæolithic or microlithic—in the concerned river-valleys; it is true some of the terraces and their slopes could not be thoroughly examined owing to paddy-cultivation and other vegetation. It nevertheless collected very useful data regarding the Pleistocene geology of the region.

The expedition headed by Shrimati D. Mitra of the Survey explored part of the Nepalese *tarai* contiguous to north-eastern Uttar Pradesh and subsequently excavated a few selected sites. It brought to light a large number of sites in Bhairwa and Taulihawa Districts, ranging in date from *c.* fifth century B.C. to *c.* fifteenth century A.D. In Taulihawa District it excavated the sites of Kudan and Tilaura-kot.

At Kudan, which is within 3 kilometres of the site (Gotihawa) of an Asokan pillar, is a series of four mounds distributed along the banks of an ancient tank. The excavation brought to light a well and two temples. Made of bricks and ascribable to *c*. A.D. 1000, the temples are noted for their exquisite carvings (Pl. V*b*).

Tilaura-kot, as its suffix 'kot' indicates, was a fortified township, whose fortifications go back to the beginning of the Christian era; the site itself is older, as evidenced by the presence in the pre-defence deposits of the Northern Black Polished Ware and black-slipped and grey wares, and also several terracotta-ring wells (Pl. VI*a*). Amongst other antiquities recovered here were punch-marked coins, terracotta human and animal figurines, terracotta sealings, beads of a variety of semi-precious stones, and objects of iron, copper, glass, etc.

The excavations fully bear out that, during historical times, the material culture of the Nepalese *tarai* was in no way different from that in the adjoining regions of India.

THE ARCHÆOLOGICAL SURVEY BECOMES A CENTENARIAN

On 1 December 1861 the Archæological Survey of India was born, with Alexander Cuningham as its first nurse. It grew steadily, and at the turn of the century, it reached a status which many of its contemporaries could envy. Indeed, in 1961, our centenarian could easily boast of being 'one without others', even internationally. Thus, when in December 1961 the country celebrated the Centenary of its Archæological Survey, it was showered with congratulations and blessings from all quarters of the world.

On this occasion, the Survey held a large-scale, well-displayed exhibition (Pl. VI*b*), which publicized its multifarious functions, ranging from structural and chemical preservation of ancient monuments to practical training in field archæology. It also organized an International Conference on Asian Archæology—the first one ever held. Over two hundred delegates, from the United States of America on the west to Japan on the east and from the Union of Soviet Socialist Republic on the north to Indonesia on the south, came to attend the Conference. With Shri A. Ghosh, Director General of Archæology in India, as the General President and the present writer as the General Secretary, the Conference was divided into four sections: *(i)* General archæology and archæological methods, *(ii)* Archæology of the Stone and Bronze Ages, *(iii)* Archæology of the Later Ages—general, and *(iv)* Archæology of the Later Ages—Art and Architecture, presided over respectively by Sir Mortimer Wheeler and Professors Robert J. Braidwood, Tatsuro Yamamoto and S. Paranvitana. It is impossible to go here into the details of the papers read at the Conference, but the meeting was so generally stimulating that the delegates present, under the leadership of Professor M. E. L. Mallowan, resolved that the Conference be held quinquennially, and our eyes are thus turned to 1966.

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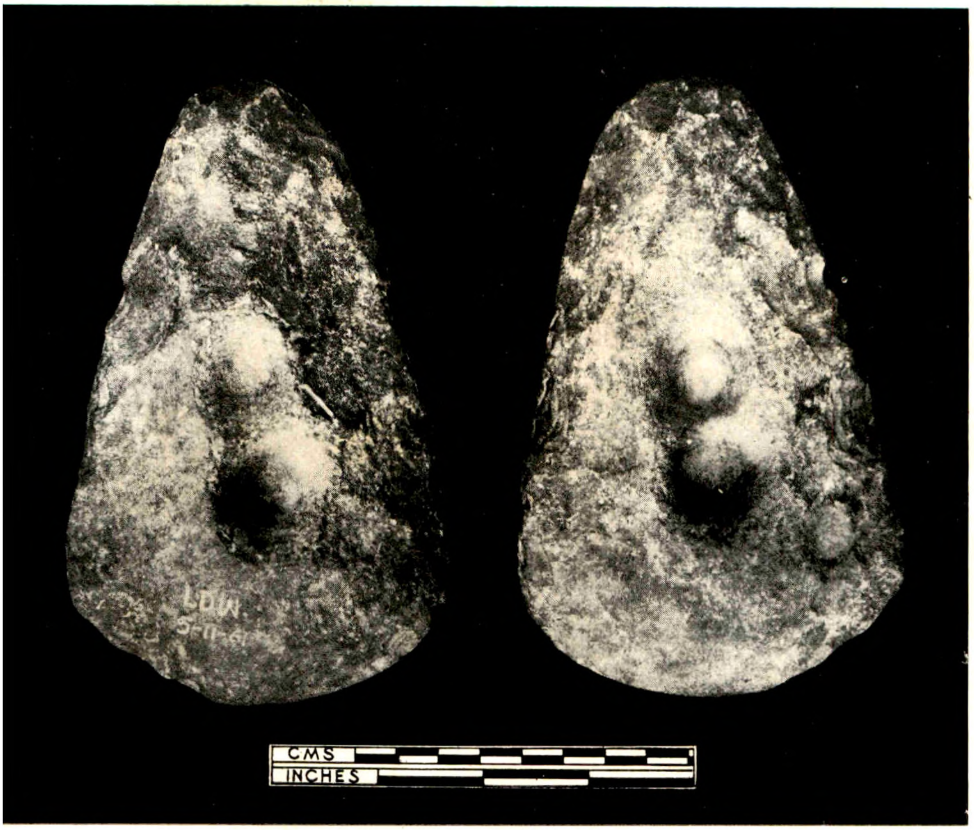
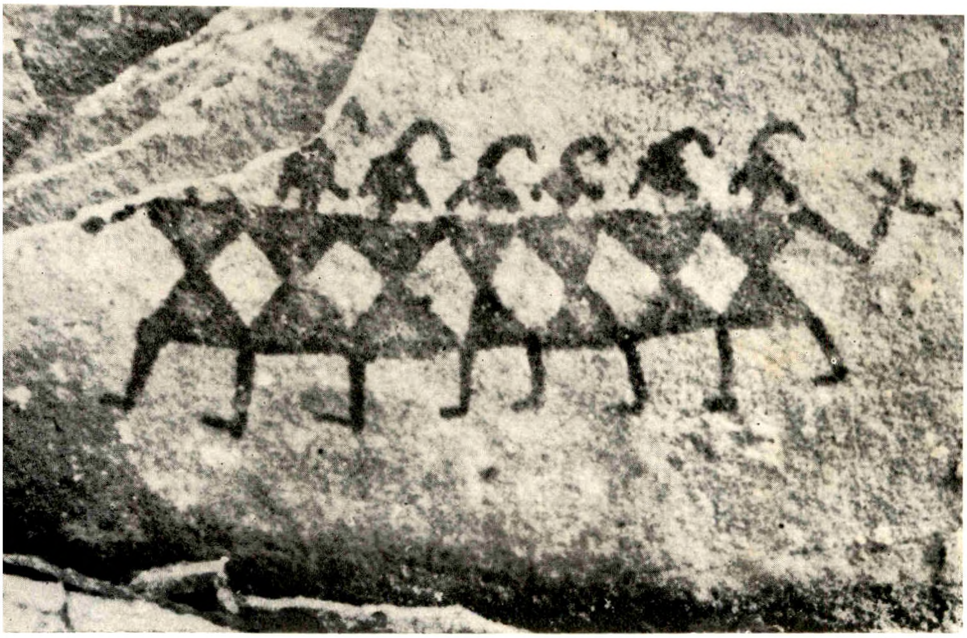


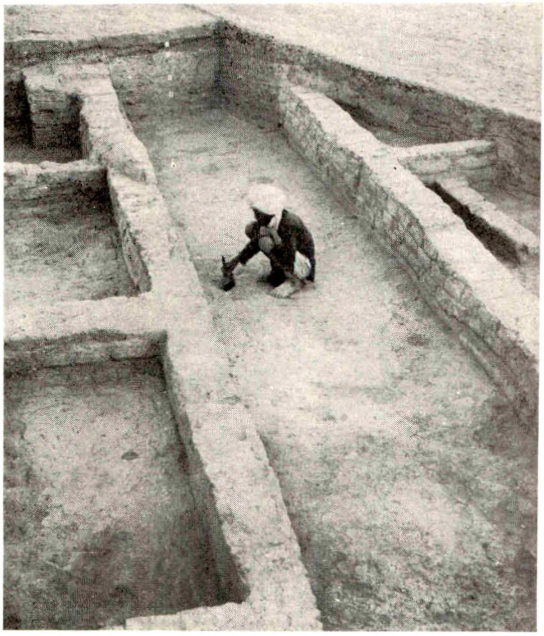
Banaras Hindu University, Varanasi

a. LODHWARA. Polished stone axe with a pair of small pits on each side (see p. 29)

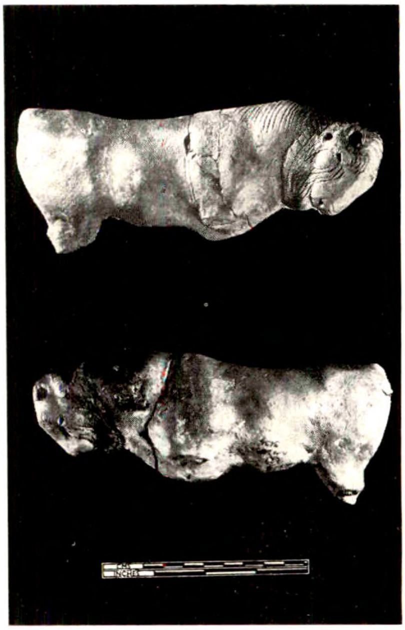


K. P. Jadia, Panna

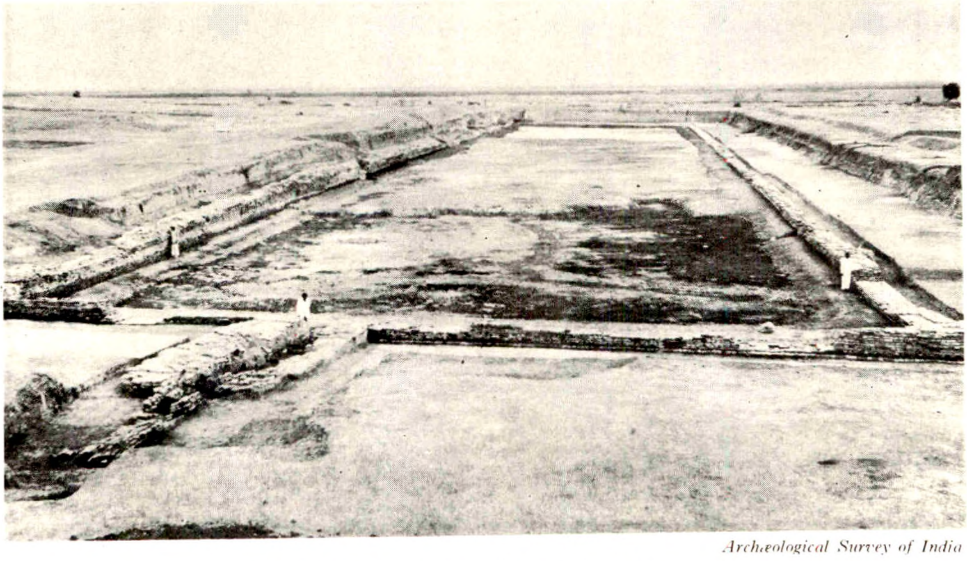
b. BRIJPUR. Painted figures (see p. 29)



a. KALIBANGAN. General view of pre-Harappan structures (see p. 30)

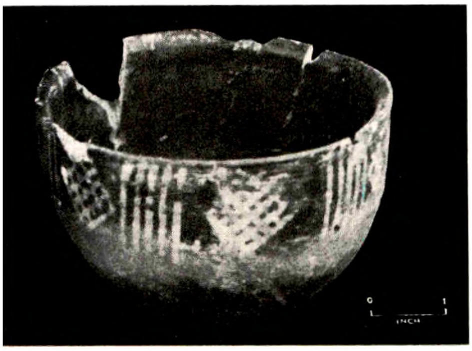


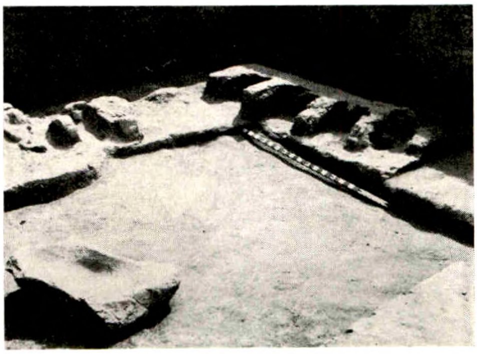
b. KALIBANGAN. Terracotta bull (see p. 30)



Archæological Survey of India

c. LOTHAL. General view of the dockyard (see p. 30)

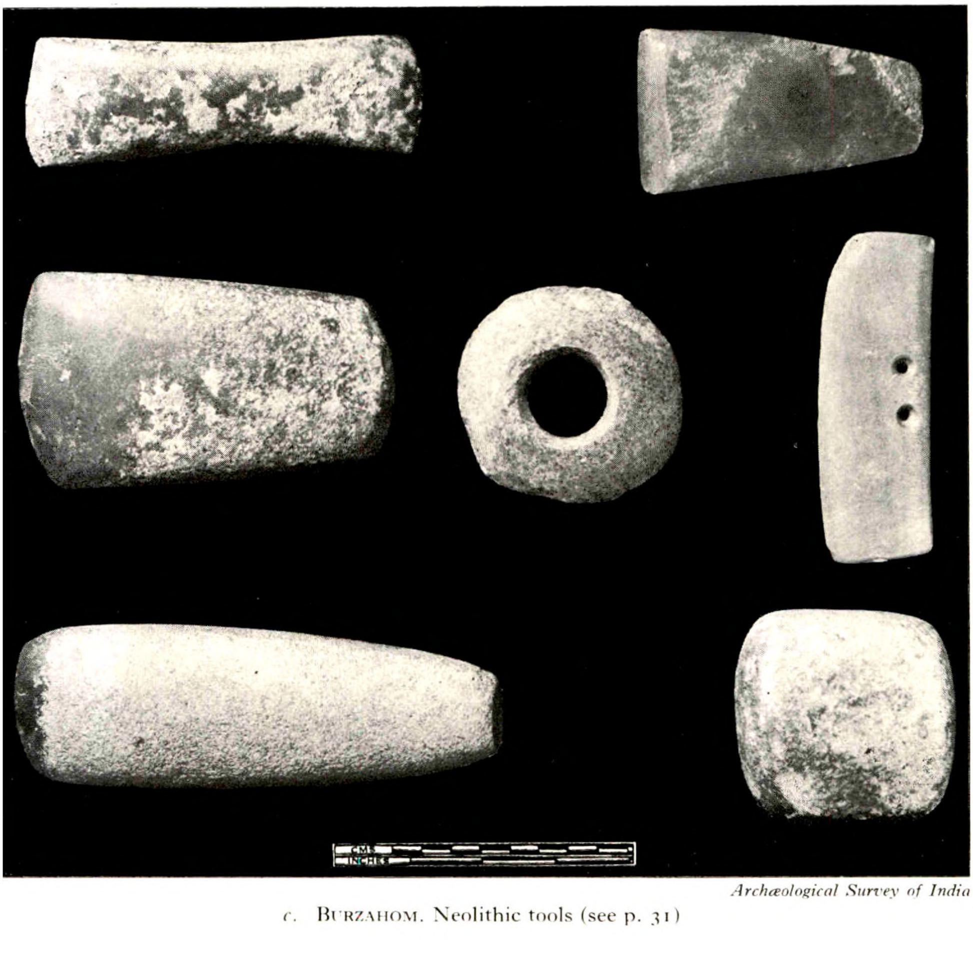




Deccan College Post-graduate and Research Institute, Poona

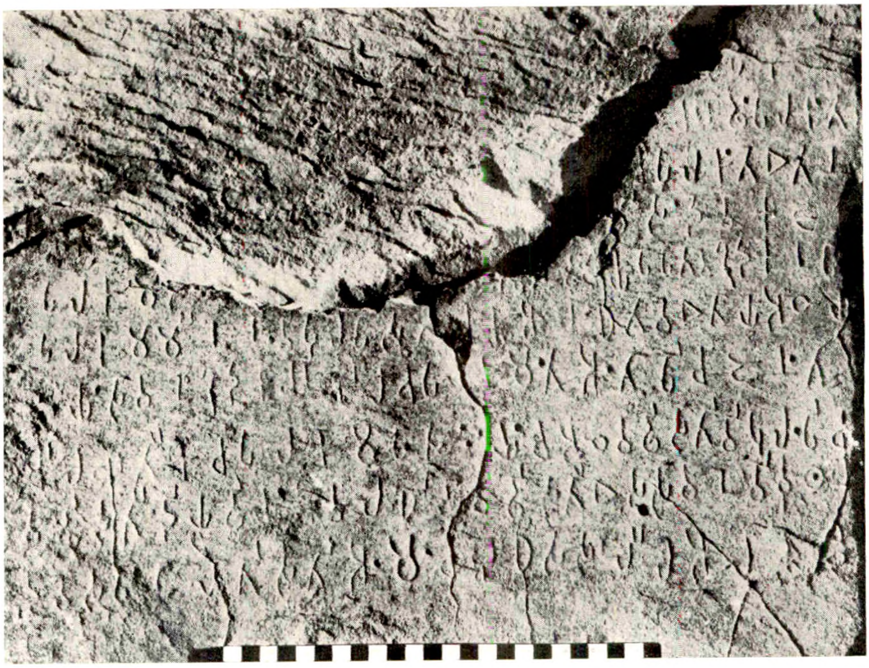
a. Ahar. White-painted black-and-red ware (see p. 30)

b. Ahar. Hearths (see p. 30)

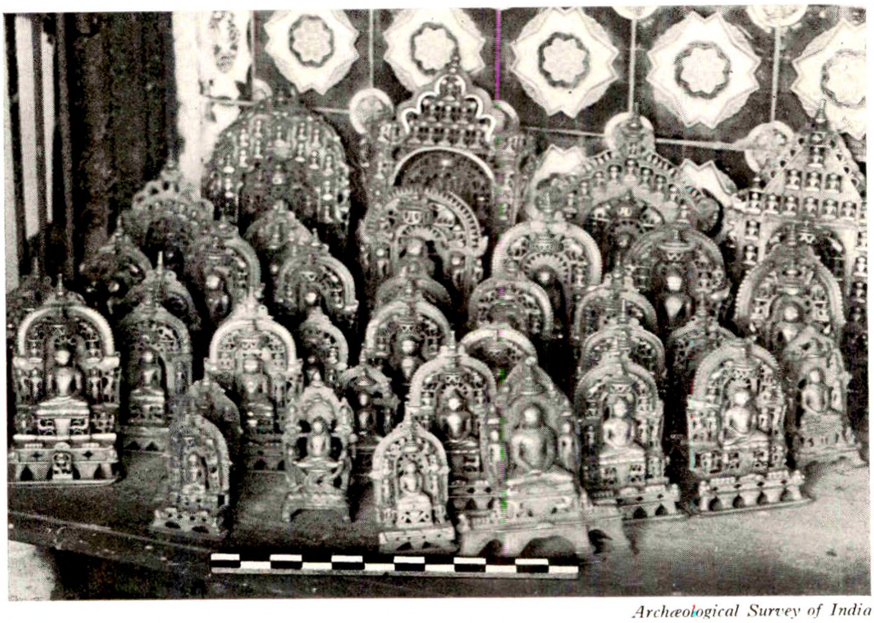


Archæological Survey of India

c. Burzahom. Neolithic tools (see p. 31)

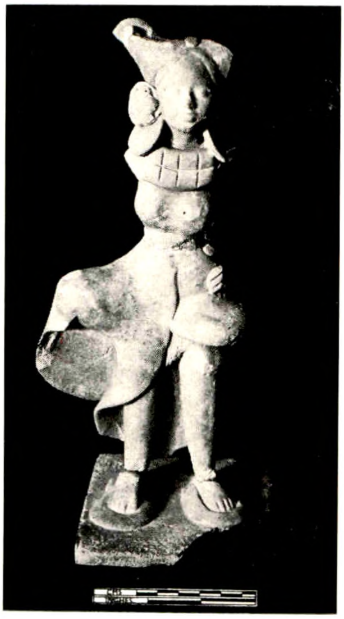


a. AHRAURA. Rock edict of Asoka (see p. 33)



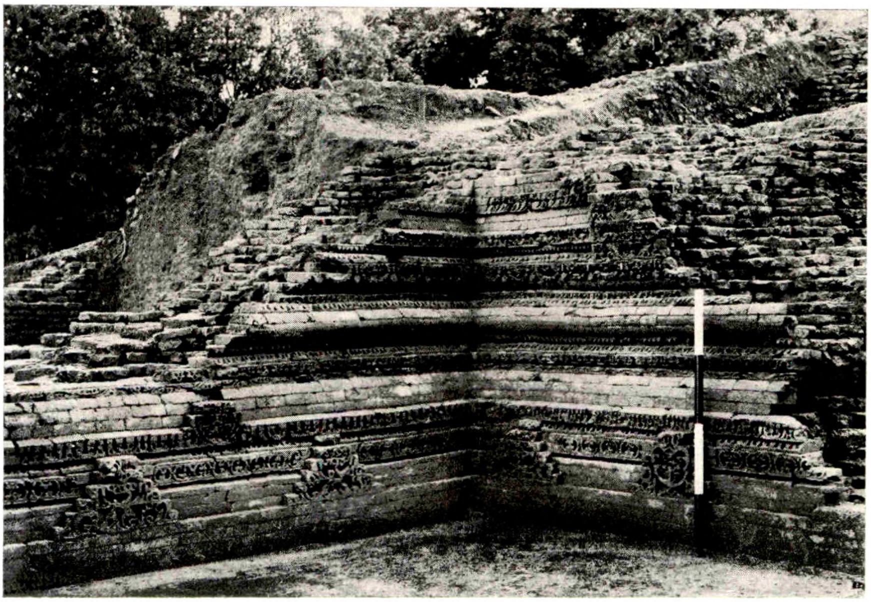
Archæological Survey of India

b. GHOGHA. Hoard of images (see p. 34)



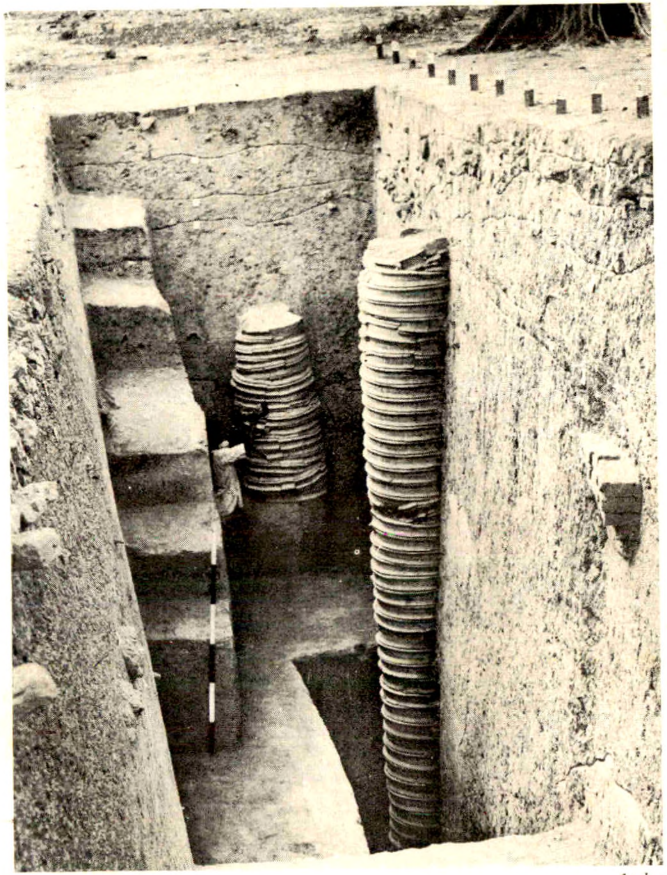
Directorate of Archæology and Museums, Government of Bihar, Patna.

a. SONPUR. Terracotta figurine (see p. 33)

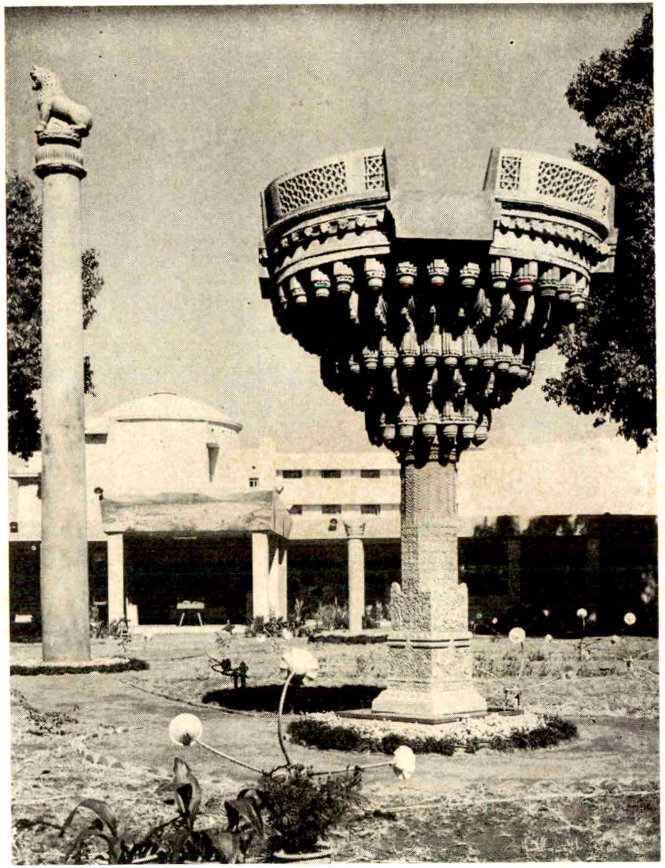


Archæological Survey of India

b. KUDAN (Nepal). Façade of Temple I platform (see p. 36)



a. TILAURA-KOT (Nepal). Ring well (see p. 36)



Archæological Survey of India

b. NEW DELHI. At the Centenary Exhibition (1961), in front of the pavilions are life-size casts of the Asoka pillar, at Lauriya-Nandagarth *(left)*, and the pillar in Diwan-i-Khas, Fatehpur-Sikri *(right)*. See p. 36

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7

Ceylon

P. E. P. DERANIYAGALA

Received 1 April 1963

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A popular account of the three extinct hominoids of Ceylon, viz. *Homopithecus sinhaleyus, Homo sinhaleyus* and *Homo sapiens balangodensis*.

1961*a* Some mammals of the extinct Ratnapura Fauna of Ceylon, Part IV, *Spolia Zeylanica* (Colombo Museum Bulletin), **29**(1): 1–14, 3 pls, 2 figs.

Fossils of ten extinct vertebrates are described, among which two Hominoids, viz. *Homopithecus sinhaleyus* gen. et sp. nov. and *Homo sinhaleyus*. Uranium assays by the British Museum of the teeth of elephant, rhinoceros and hippopotamus fossils from Ceylon are also given.

1961*b* Deposition of dentine in the fossilized tusk of *Elephas maximus sinhaleyus, Spolia Zeylanica*, **29**(1): 15, 2 pls.

Fossil tusk fragments of the extinct *Elephas maximus sinhaleyus* are figured and described. They reveal that ivory is deposited both as a series of irregular islands and as concentric layers.

1961*c* The stone sarcophagi of the ancient and medieval Sinhalese, *Spolia Zeylanica*, **29**(1): 87–89, 5 pls, 1 fig.

Stone sarcophagi from three different sites indicated affinities with those of Egypt and also give some idea of the height of an average man of the period.

1961*d* The Maradanmaduva-Tabbova Culture of Ceylon, *Spolia Zeylanica*, **29**(1): 91–94, 3 pls, 6 figs.

Grotesque and realistic terracotta figurines of humans and animals are figured and described, many are of phallic design. They appear to belong to an ancient fertility cult.

1961*e* An open air habitation site of *Homo sapiens balangodensis* (Part II), *Spolia Zeylanica*, **29**(1): 95–109, 1 pl. 8 figs.

The stone and bone tools of *Homo sapiens balangodensis* that were dug up from a kitchen-midden at Bellanbändi Pälässa are figured and described.

1962*a* The amphitheatres of Minihagal Kanda, their possible origin and some of the fossils and stone artifacts collected from them, *Spolia Zeylanica*, **29**(2): 149–163, 8 pls, 4 figs.

These amphitheatres are possibly of volcanic origin; their stone-age camp sites with stone implements found in them are discussed. The presence of a bilobate tranchet suggests that they are of meso-neolithic age.

1962*b* The extinct hippopotamus of western Asia, *Spolia Zeylanica* **29**(2): 241–242.

The name *Hexaprotodon asurus* is conferred upon the extinct hippopotamus of Palestine, Mesopotamia and Syria, and it is suggested that the ancient terracotta figurines from Byblos represent this species and not the African animal. This view is supported by the numerous hippopotamus fossils recently discovered in the Jordan valley by Haas. It is suggested that the mythical 'Makara' of Asia is the modern man's dim remembrance of the hippopotamus that once inhabited southern Asia.

1962*c* Was the extinct *Elephas maximus sinhaleyus* as hirsute as the young of *Elephas maximus maximus?, Spolia Zeylanica* **29**(2): 246–248, 1 pl. 1 fig.

The hair tracts of a young *Elephas maximus maximus* are studied and it is presumed that this juvenile hirsuteness was the normal adult condition of the extinct *Elephas maximus sinhaleyus*, which had inhabited Ceylon with other extinct animals when the climate was cooler than at present.

1962*d* Some new records of the Tabbova-Maradanmaduva Culture of Ceylon, *Spolia Zeylanica*, **29**(2): 249–272, 4 pls, 8 figs.

These new records of the Tabbova-Maradanmaduva cult indicate that they are part of the cult of Jagan Matha or the Mother Goddess. The presence of a hole in the forehead above the hair line in a number of the terra cotta statuettes is also noted from statuettes of other races such as the Aztecs. This cult probably originated in Mesolithic times.

1962 *A Guide to the Colombo National Museum.*

This includes the 'Ratnapura' and the 'Balangoda' culture phases of the stone age of Ceylon and contains several illustrations.

1962*a* The extinct Gaur of Ceylon, *Ceylon Today*, 11(3): 14–16, 1 pl. 1 fig. (Ceylon Government Information Department publication).

Bibos sinhaleyus was exterminated by the Sinhalese in historic times. The top of the skull and the horn cores that were dug out of a gem pit are figured.

1962*b* The extinct hippopotamus of Ceylon, *Ceylon Today*, 14(9): 28–29, 1 pl.

The left half of the mandible of *Hexaprotodon sinhaleyus* dug out of a gem pit is figured. This species possessed six incisor teeth of which the second pair were greatly reduced; the third incisors were the largest. Its closest relative is *Hexaprotodon namadicus* of the Nerbudda lake deposits of India which are of middle Pleistocene age.

8

Madagascar

PIERRE VÊRIN

Received 11 March 1963

In my article 'Rétrospective et Problèmes de l'Archéologie à Madagascar', which appeared in French with an English résumé in *Asian Perspectives* **6**, 188–218, I briefly mentioned the test excavation at the site of Talaky, about which a report has appeared in the first issue of the *Annales de l'Université de Madagascar*, in February 1963. In the meantime the carbon sample from the site (Talaky, Zone B, site 2, C4–5) has been analyzed by Professor Kunihiko Kigoshi of the Department of Physics and Chemistry, Gakushuin University, Tokyo, Japan. The sample (Gak) gave a date of — 840 years ± 80. This first attempt of dating an old site of the island is encouraging and samples from other sites are being sent to Tokyo this year. The protohistorical inhabitants of Talaky had a maritime culture which bears similarities with the Vezo culture several hundred miles to the northwest. At the beginning of the second millennium iron was widely known in the area and sea voyages were more important than now. Other coastal sites between Tuléar and Fort-Dauphin will soon be studied by R. Battistini and P. Vérin.

Besides its activities concerned with dirt archæology, the Département d'Art et d'Archéologie, of the University has acquired a magnificent collection of wooden images from the Vezo cemetery of Bosy-Andraingy near Morondava. The Vezo still decorate their tombs with beautifully carved images of their defunct ancestors. Christianity which is spreading in the area has not wiped out the practice; even today one may see on some tombs Christian crosses surrounded with images of mating couples. However many new converts prefer burials without the decorating motives of the old pagan times. When the tombs are rebuilt the wooden images are thrown out and left to rot. Before collecting them, R. Mallet, P. Vérin and a few volunteers had to negotiate with the owners and perform the traditional ceremonies to propitiate the ancestors buried in the cemetery.

Two exhibitions were held; the first display was opened to the public in the University in September 1963, the second one was held at the town hall of Antananarivo the capital; over 60,000 people visited the exhibition. The catalogue printed in February 1963 contains 38 large size photographs of sites and specimens.

In August 1962, M. Babin, an amateur archæologist, made a field trip in the Bemaraha area and investigated the numerous burial caves in the cliffs along the shores of the Manambolo river. One important site has been mapped. Pottery, beads and a coin dated 1755, have been collected and turned over to the laboratory of the Département d'Art et d'Archéologie. A more careful study will determine whether some of the burial caves may not have been used prior to the European period. A few skeletal remains have also been collected by Babin and are now being studied by Dr Chippaux, Director of the General Hospital Girard and Robic, Tananarive, who is reader in Physical Anthropology at the University.

A-M. Lavondès was not able to join the Department of Art and Archæology and S. Raharijaona became a member of the Department staff as from November 1962. Raharijaona completed a study of the upright stones and megaliths in Madagascar, which appeared in the *Revue de Madagascar*, 4e trimestre 1962, a quarterly published by the Service Général de l'Information. She describes the various kinds of uprights, which she calls *les pierres levées* and defines their functions as known from ethnographic reports. Raharijaona also recently completed a field trip in the southeast of Madagascar, buying artifacts for the Musée de l'Université.

M. Elie Vernier, Attaché au Musée de l'Homme, Paris, has been collecting artifacts to enlarge the Malagasy collections in his museum. At the request of the University he also completed a detailed catalogue of one of the most important collections in Madagascar, belonging to M. Charles Poirier; it contains more than 2,000 artifacts, mostly ethnographical—the University hopes to acquire it for its Museum.

Among the contributions which recently appeared on Malagasy Archæology and Culture History, Jacques Dez's article, *L'apport lexical de l'Indonésien Commun à la langue Malgache*, is worthy of mention. Dez classifies the words of Malagasy (including those from many dialects) originating from the Proto-Indonésien which Dempwolf called *Urindonesisch*. Dez's conclusion is especially interesting and even should one question the reliability of *Wörter und Sachen* methods, it serves as a working hypothesis. Dez states:

> En définitive, il apparaît que le principal du vocabulaire malgache permettant à l'homme de se décrire lui-même, de décrire ses actions et le monde qui l'environne, vient de l'indonésien commun et constitue le plus vieux fonds de mots de la langue malgache, et, sans doute, d'idées aussi. Il semble que l'on puisse en déduire que la conception malgache globale de l'Univers est plus proche des conceptions indonésiennes que d'aucune autre.
>
> L'héritage de l'ancienne civilisation indonésienne paraît notamment attesté, et plus particulièrement, dans l'expression des sentiments religieux, et dans la pratique d'un certain nombre de techniques, au nombre desquelles il est possible d'énumérer: la construction des maisons, la vannerie, le cordage, la poterie, la forge, la navigation, la numération les activités commerciales. Par contre, on notera qu'en matière d'élevage et d'agriculture, le vocabulaire est très pauvre et se réduit pratiquement à celui de la culture sur brûlis forestier. Doit-on en déduire que la domestication des animaux et les autres modes de culture ont été l'objet d'emprunts à d'autres civilisations? Pour l'instant, on ne peut que poser la question et affirmer qu'en tout cas la linguistique comparée ne saurait à elle seule la résoudre, qu'elle ne saurait constituer que des indices.

Also of interest is the article by Raymond Decary, *Les Anciennes industries du métal à Madagascar*, a good summary of the anthropological literature on industries and artifacts of iron, copper and gold in the island. Some of the types of jewels which he described were discovered by Babin in the burial caves of the Manambolo river.

As this article is being sent to the editor, Paul Ginther and Jean Claude Hébert, have published a description of the site called *Grotte des Portugais*, in the mountains of Isalo near Ranohira. In a lofty area known as *Le Cirque de Tenika* are clustered caves, the entrances to which are partially closed by walls made of cut stones, flat areas with foundation stones, artificially hollowed excavations at the base of the cliffs, carved blocks of stones, etc. . . . The function of these stone structures is so far unknown and the names which have been given to them such as, *les sarcophages, le temple du soleil, la colonnade du marché, les réceptacles, les nids de pigeons*, may be misleading. The report gives few indications on excavations which 'yielded no results', probably because hidden structures were searched without taking the precaution to sift the earth removed. The map of the cave does not even indicate where the trenches were dug.

The protohistorical inhabitants of the Tenika caves might have been people connected with the Rasikajy culture, the trading culture which dominated the western part of the Indian Ocean before the Portuguese took over. Hébert picked up in Tenika some potsherds of *poterie noire vernissée* [black polished ware], which he thinks are very similar to some which he collected in Antsoheribory, a Rasikajy site of the north-west coast of Madagascar. Of course this pottery might have reached the site by trade. More recent Portuguese castaways might have temporarily occupied the site, but there is no real evidence of their occupation and the name 'Grotte des Portugais' for the Tenika site should be avoided. More systematic work should be done on this interesting site.

In the near future, the Département d'Art et d'Archéologie plans to undertake excavations in the Vohitrandriana site (near the Alaotra lake) where a few years ago road construction cut down through deep layers containing a beautiful black and red pottery. Coastal sites (dune sites and caves) between Tulear and Fort Dauphin will be investigated. Later on, as soon as the beginning of the dry season enables better communications, test excavations will be opened in the Rasikajy site of Antsoheribory.

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KARCHE and BEHIER

n.d. *Analyse chimique des perles découvertes en août 1962 dans les gorges du Manambolo*, 2 pp.; manuscript with Faculté des Sciences de Tananarive.

9

Malaysian Borneo

BARBARA HARRISSON

Received 23 May 1963

ACTIVITIES OF THE SARAWAK MUSEUM

Personnel and Contributions. The Museum's activities were handicapped in 1962, by the absence overseas of the Junior Assistant Curator, Mr Lucas Chin, training in Hawaii's East-West Center, and of the Archæological Assistant, Mr Richard Nyandoh, who was seconded for training under Professor W. R. Geddes at the University of Sydney. But expatriate local residents taking up special Museum interests filled the gap and contributed to keep research going and the records up to date. They were Mr W. P. N. L. Ditmas on folklore studies; Dr Yim Khai Soon on human remains; Mr J. Chater on archive work; and Mrs L. Wall and Mrs E. Moore on archæological material, with particular reference to prehistoric earthenware and import ceramics.

The Curator, Mr Tom Harrisson, attended the International Centenary Congress on Rizal held in Manila in December 1961 and remained in the islands for some weeks as the guest of the Philippine Government and the National Museum of the Philippines. In February 1962 he attended a Conference of the International Geographical Union at the University of Malaya in Kuala Lumpur, where he contributed a paper on Niah Archæology and a full-session evening talk with films on the geography and peoples of British Borneo.

The Max-Planck Institute for Brain Research invited B. Harrisson in April 1962, to attend a Primate Conference organized by the Institute in Giessen, Germany. She contributed there a paper on Orang-utans.

A high-ranking distinction, the Founders Medal in Gold, was awarded in January 1962 to Tom Harrisson by the Royal Geographical Society, for sixteen years of pioneer exploration in Central Borneo. He was able to turn that gold into political currency, eleven months later, when a rebellion broke out in Brunei and northern Sarawak at the beginning of December. Then his unique knowledge of the interior's jungle borders and intimacy with its residents enabled him to give detailed service and advice to the British Forces that were rushed to Borneo at the time. He rallied volunteer guerillas in the Fourth and Fifth Divisions of Sarawak and successfully operated with 2,000 of them in conjunction with the British Army, until the country was clear of rebels. He has since built up a permanent organization of Border Scouts. In a small, lively booklet for the benefit of the Forces serving in Borneo the Curator described the historical background of the Brunei rebellion and the complexity of interests, races, ethnological and geographical difficulties in the trouble areas (T. Harrisson 1963*a*).

Archives. The Museum's Archives now incorporate most important documents from outstations in Sarawak. This material is being slowly indexed; a start was made with the cases registered since 1887, in the Simanggang Court Books. There are years of work ahead to catch up in sorting, filing—and presenting later for publication—much of the unique papers, specially from Sarawak's Brooke period. The Department of History of the University of Malaya (Prof. J. Bastin; Prof. Wang Gungwu) have taken a close interest in the Archives. The Museum's Archivist, Mr Loh Chee Yin, returned to Kuching during 1962 having won the Certificate of the New Zealand Library Association under Colombo Plan auspices.

The Editor of the *Sarawak Museum Journal*, Mr Tom Harrisson, issued a *Jubilee Number* (**10**, 17–18, 1961) on the occasion of the *Journal's* fiftieth birthday. Fifteen articles by various hands present archive material or memories.

The Museum's photographic archives, comprising over 10,000 negatives, were reorganized and re-numbered during 1961/2. Some pre-1900 material of exceptional quality miraculously survived the pre-airconditioned decades of tropical climate. Accurate dating and identification of some of the earlier material is still incomplete.

A 20-minute sound-film, showing (in 16mm black-and-white) the traditional Punan-Melanau burial rites of the Niah area, was produced by a Museum team and incorporated in the Archives.

Folklore and Linguistic Studies. The Asia Foundation, which sponsored a period of advanced training by Mr G. Jamuh, Assistant Curator, and the main costs of a Borneo-Philippine Seminar held in 1961 (see *AP*, **5**: 61), in 1962 made a grant for the publication costs of the seminar's studies, which appeared in the 1962 July–December issue of the *Sarawak Museum Journal* (**10**: 19–20), by Drs J. R. Francisco, A. C. Haddon, José Maceda, G. Jamuh, B. Sandin, R. Bewsher and others.

During the year, much energy has also been put into the re-capture and recording of native lore, as even some of the most ancient and venerated themes of the past are rapidly becoming obscure with new moral tones or materialistic tinge. The Assistant Curator, Mr George Jamuh (himself a Balau Dayak), and the Research Assistant, Mr Benedict Sandin (a Saribas Iban), made extensive field tours in the Niah-Bintulu districts of the Fourth Division, the Belaga-Baleh area and the Mukah-Oya districts of the Third Division of Sarawak. Three groups of informants from Kalimantan also spent periods of up to a month in Kuching recording material from the Potok Muruts of the north-west, the Kenyahs of the Batang Kayan, and the Kayan and Ba Maloh peoples of the Kapuas river in the south-west of Kalimantan. The legends and ancestry of these neighbours across the border is of great interest and relevance to Sarawak because a large proportion of the inland population originated from the south and east, only migrating north-west over the spinal range of the island in the past three or four centuries. To get a clear picture of the Sarawak peoples it is essential to take their overland origins and migrations into account.

Zoology

A thorough investigation of Bornean mammals, with a view to producing a Checklist to be followed by detailed ecology and behaviour studies of individual species, was started by Tom Harrisson and Lord Medway (Department of Zoology, University of Malaya) early in 1962. The Checklist will be based on Bornean material in reference collections the world over, which Lord Medway has undertaken to review, during 1962–3. At the Borneo end of the chain collection of poorly represented families and species was intensified.

At the same time, behaviour studies were made of captives, especially primates. Tarsiers, Flying Squirrels, Slow Loris, bats and other difficult nocturnal mammals whose behaviour pattern has so far not fully been investigated, were kept under close observation for long periods.

The special study of Orang-utans was continued by Mrs Harrisson (whose book *Orang-utan* was published in London in 1962), under the auspices of the World Wildlife Fund and the Wenner-Gren Foundation. In June 1962, three captive Orang-utan orphans were transferred from Kuching to Bako National Park in the Sarawak river delta, to grow up there, semi-wild, under close observation and guidance. This study will continue for some years. It is producing a wealth of new information on spontaneous jungle behaviour of young Orang-utans. Nine months' experience demonstrate that: *(i)* young Orang-utans re-adapt themselves to wild living patterns; *(ii)* this process is slow and in accordance with age and temperament of the individual animal and in gear with its social needs, i.e. dependent on available human or ape-companionship, and guidance; *(iii)* an arboreal parent can be replaced to a certain degree, by a human tutor.

Orang-utan nest-counts were made by Mrs Harrisson in three separate habitat areas of North Borneo in order to determine the numerical status of the wild animal in that country and to supply recommendations to the World Wildlife Fund for the preservation of this threatened species.

The Chicago Natural History Museum in September 1962, sent a field party to work in the Balleh area of the Third Division of Sarawak. Drs R. F. Inger and B. Greenberg remained in the field for two months, leaving Dr Wayne King behind who still carries on in the area in spite of much insecurity, excessive floods and no doubt, personal discomforts. His ecological study of amphibians and their cycles, however, should provide adequate compensation.

ARCHÆOLOGY

A. Indoor Studies

Pottery. Much of the year was devoted to analyse material collected during previous years of field work; and in particular the study of prehistoric earthenware pottery from Niah and elsewhere in Sarawak under Mrs L. Wall—who also compared at first hand this with material in Singapore and Malayan Museums (Wall 1962); the reconstruction of earthenware from the neolithic burial site of Lobang Jeragan, Niah; and of import ceramics from the Painted Cave, Niah, as well as of Ming-dated material from the Kelabit highlands and post-Ming material from near Miri in north-east Sarawak.

The reconstruction of archæological earthenware and import ceramics—a lengthy task as nearly all of it is highly fragmented—is necessary if detailed identification and interpretation of a burial site is attempted. At the same time, comparisons are made with dated material published elsewhere; but unfortunately, in the case of the 'ordinary export-ceramics', little concrete information is available. Exchange of sherd-materials with other researchers (Honolulu Academy of Arts, Hawaii; Ashmolean Museum, Oxford; Oriental Ceramic Society, London) is the alternative line of investigation in this field where much uncertainty as to dating, provenance and early trade-routes of mainland ceramics persists. This section of the Sarawak Museum's organization (now under Mrs E. Moore) would appreciate further outside interest, especially from the Asian and Pacific sectors with a view to exchanging sherds from dated archæological sites or kiln sites.

Beads. Glass and stone beads are a usual feature of a Bornean burial site which includes imported ceramics. In view of the immense varieties of shape, form, colour and decoration that occur—coupled with strong elements of fashion which brought selective material into specified areas at certain times—it is usually difficult to do more than describe a bead or types of beads obtained from any one site. A classification enabling a student to analyse his material both visually and chemically along certain criteria in a sequence of decreasing complexity, is badly needed to be able to document much bead material which has so far been stored for better or for worse.

Alastair Lamb and Tom Harrisson got together in January 1962 in Kuching to try to work out such a classification basing it on the rich reference material available both in the Sarawak Museum and in the University of Malaya. A campaign for exchange with interested parties overseas was launched at the same time and arrangements were made for chemical analysis of set types—some of which have already been published in *AP*, **6.** Further material and suggestions are welcome.

Bone Remains and Artifacts. D. A. Hooijer continued his expert study of the remains from Niah Great Cave and produced an analysis of bone of prehistoric gibbons and monkeys; Dr Wayne King similarly reported on the reptile and amphibian bone, including fully palæolithic identifications (Hooijer 1962; Wayne King 1962).

A special study of bone and tooth artifacts by Tom Harrisson and Lord Medway was published in December 1962 (*SMJ*, **10:** 19–20: 335). It describes in detail, 206 artifacts from Niah Great Cave, classified into 18 categories based on visual analysis of shape and form, and arranged in a broad sequence of decreasing complexity. The material is richly tabled and illustrated and should serve well as a reference guide for archæological bone artifacts from Borneo or wider afield. A summary of this has appeared in *AP*, **6:** 219–229.

B. Field Studies

Niah. A small field unit worked in Niah during November-December 1962, on special aspects of the Painted Cave, where close to 200,000 items had already been excavated during two previous field-seasons (*cf.* previous reports in *AP*).

Special attention was devoted to relating the vivid scarlet wall paintings of death ships to the carved hardwood boat-coffins scattered about the cave floor. It was possible to establish the positions of post-holes spread below the main line of murals and to fit into them exactly fragments of uprights which once supported the boat coffins above ground.

The approaches to the Cave itself were also investigated in detail. Steps were found to have been cut or worn into the basic rock of the Cave mouth—and the limestone of the underlying floor itself had been trodden and polished by what can only be mass dancing as part of the burial ceremonies. Subsequent human activities and natural depositions of the Cave fauna and flora had overlaid this dancing floor which was reached for the first time in November 1962.

Excavations were also extended to the lower section of the Painted Cave and to the exploration of the cliffs encircling it. A series of small grottos high up on a ledge were discovered. These contained well preserved remains including bronze, woodwork and even textiles. Associated import ceramics suggest the same date limits as in the main Painted Cave, between early T'ang and early Sung.

A detailed analysis of the material from the Painted Cave is well in hand.

Kelabit Uplands. The main theme of a Museum unit working in the Kelabit uplands during September and October 1962 was a full study of some of the impressive stone monuments (megaliths) which until recently the Kelabits erected to the memory of their ancestors at great *Irau* feasts.

The 1962 operations aimed at a detailed analysis of selected individual megaliths with a view to determining their date more precisely. Special attention was paid to the numerous stone dolmens and slab graves around Pa Lungan, to a huge dolmen and related carved stones on the uninhabited Pa Ra, west of Bario, and at Long Berang, ten miles down the now uninhabited valley of the Lebun (true headwaters of the mighty Baram river, here only a few yards wide). This work proved painstaking owing to the difficulty of excavating under the monuments without bringing them crashing down with fatal results both academically and physically! Valuable material was obtained, including dateable series of pottery, metal and other remains. A full analysis is now being made (*cf.* also T. Harrisson 1962 *b*, *c*).

Preliminary results confirm that the Kelabits have been resident in the far uplands over many centuries, and that the present system of irrigated rice cultivation as practised at Bario is of considerable antiquity—though its origins may not necessarily be bedded in *rice*. It is also further clear that the Kelabits have been in longer continuous occupation of any one place than any of the other peoples of central or western Borneo. There is also evidence that, despite of its extreme isolation, the area was inhabited well back into the stone age. But there is no evidence, so far, to associate the megalithic monuments with the stone age. The monument idea seems to have begun long after the arrival of metal—and perhaps not until well on into the iron age, conceivably after A.D. 1000 in this hinterland.

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10

Philippines

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The National Museum is still the only institution in the Philippines with a long-range programme of organized and sustained archæological research. In early 1962 it sent out two expeditions: *(a)* a two-man team headed by the writer which carried out an extensive survey of limestone caves in the central Philippines; and *(b)* another two-man team headed by Dr Robert B. Fox which undertook a small-scale excavation project on eastern Palawan Island and then proceeded to its western coast, facing the South China Sea, to explore a number of limestone caves on Lipuun Point (also known as Albion Head). The latter area led to discoveries of worldwide interest, for among other materials, a 'Late Pleistocene Stone-Age Complex' was found which included a fossil skull-cap representative of perhaps the earliest *sapiens* group in the Philippines. Both expeditions were supported by a grant-in-aid from the Asia Foundation.

The only other local activity which came to the author's attention was a limited cave exploration in Kulaman plateau, Cotabato province, Mindanao, carried out by Dr Marcelino Maceda of San Carlos University, Cebu City, with the assistance of a Government soil technologist. According to sketchy reports, the exploration party found skeletal remains in earthenware and stone jars, but no mention was made of the associated cultural materials. It is hoped that further work will be done in the area inasmuch as the cave appears to be the southernmost extremity of the jar-burial complex in the Philippines.

Central Philippines Cave Survey. The writer, with the assistance of Mr Inocentes Paniza, Museum geologist, explored the limestone formations on the islands of Burias, Ticao, Masbate, and Higantes from 30 March through 4 June and in particular the caves there. All too often these numerous caves have been made useless to the archæologists by the activities of the guano digger, the pot hunter, and, as the field workers later discovered on eastern Masbate, the folk medical practitioner. Strictly speaking, however, the field work was not confined to caves, for open-air sites, reported to the team were investigated as well.

Some 14 or so individual sites were investigated on the island of Burias. Of these, 12 were open-air, and two were cave sites; and generally speaking the sites were small in area and badly disturbed by modern-day farming and ranching. The sherd samples collected indicated a range from perhaps the Late 'Iron Age' to the 15th century. A ground stone adze and a 12th century stoneware jarlet from northern Indochina or southern China were collected from a farmer who found them in his cornfield.

Of the four islands in the itinerary of the workers, Ticao was the most extensively though not completely explored. It yielded a total of 20 sites, of which 3 were open-air and 17 were cave sites. The Ticao sites ranged from rock shelters to huge caves to wide-open-air burial and/or habitation areas. No stone-age site was located but an indication of the presence of this assemblage was found among present-day cockfighters who keep stone adzes (locally known as 'thunder teeth') for honing their spurs. The ensuing metal age is abundantly represented on this island and future excavations on at least four sites should bring to light significant new data which we lack to fill the gaps in our present knowledge. An export celadon plate of Sung date was acquired from a farmer who found it in an open field overlooking a bay; and in trenching on what appears a pre-porcelain site near San Jacinto town, the team found a burial jar.

The investigators located no less than 16 sites along the eastern coast of Masbate —11 were cave sites. Several surface materials of highly diagnostic cultural interest, which were collected, included a carved coffin and a skull-box of 14th and 15th century date, the latter being perhaps the finest example of pre-Spanish wood art yet found in the Islands. A clay figure of a human head was found in one of the caves on this part of the islands, but unfortunately no further work is possible as much as the cave floor has been removed by a group of guano diggers. Many caves on this part of the island have also been stripped of their skeletal contents by the activities of the folk medical practitioner. A common practice is to file a piece of bone into powder with the tail of sting ray, add to a glass of hot water or tea and administer to the patient. The folk 'doctor' and the charm *(anting-anting)* hunter together constitute a group of people who remove skeletal (often cultural) materials from the cave; the guano digger, on the other hand, collects neither but throws everything else into some corner of or outside the cave.

Towards the end of the survey, Mr Paniza proceeded westward from Masbate to check persistent reports of caves on a group of tiny islands all named Higantes (giants) on account of the bones in the caves. They were believed to be those of huge supernatural beings—an explanation given all over the Philippines for the presence of these remains in caves which, in folk belief, are one of the known abodes of spirits. The reports were a disappointment. On account of their popularity, the caves were frequented by visitors, including excursionists, who, according to Mr Paniza, disturbed the sites to such an extent that he was only able to gather a few scattered surface sherds.

Had these sites not been disturbed in this lamentable manner they would have given us unique opportunities to find out about the pre-Spanish occupants of these islands. Of the more than 60 sites investigated, only 8 or 10 may be worthwhile excavating.

Archæological Explorations on Palawan Island. Dr Robert B. Fox proceeded to Palawan early December 1961 for further study of the inter-relationships between religion and society among the Tagbanuwa, the basis of his doctoral dissertation. He also made an ethnobotanical and an ethnozoological collection among the people for the Museum.

Fox's survey of the Pala'wan, the largest indigenous group on the island, led to the discovery of the now famous Alfonso XIII Caves. From the Pala'wan he acquired a fine material culture and folk art collection, including a superb type collection of export stoneware jars, which the people used for the ritual drinking of rice wine before their conversion to Christianity. The jars came into the area through trade beginning from late Sung to late Ch'ing periods.

At Uring-Uring, Brooks Point, Palawan, Fox purchased a few archæological specimens which the local people had dug up before World War II. One was a gold ornament of Javanese workmanshp and identified by Prof. Juan R. Francisco, Honorary Curator of the National Museum for Indo-Philippine Studies, as a garuda image, the *vahana* or vehicle of the Hindu god Vishnu. It belongs to the Indonesian Madjapahit period (13th–14th centuries). Other acquisitions were a 14th century blue-and-white Annamese plate, perhaps the largest and finest specimen ever recovered in Museum excavations; a rare Chinese 13th century blue-and-white stem-cup; and a brown and white Siamese cover bowl of 14th century date, besides several unusual celadons of the Sung period.

With the assistance of Mr Manuel Santiago of the Museum, Fox spent three weeks at Uring-Uring digging a village site of the 14th–15th century. Though the materials recovered were generally poor, the archæological data were significant according to Dr Fox.

When Fox and Santiago gave up the excavations at Uring-Uring, they went in search of older sites and, on the west coast of Palawan, came to the great Alfonso XIII series of caves in the municipality of Quezon. Before exploring the caves, they investigated a Spanish fort near the present townsite and presently in ruins; and in a quick excavation in front of the municipal building, a number of brass coins, probably Chinese, were found.

The Quezon Caves. By August of 1962, sixteen caves and ledges having cultural and skeletal materials have been located on Lipuun Point and three in the Iwa-ig area. With a grant-in-aid from the National Science Development Board, the Museum has formally set up a field station. The team headed by Fox included members of the staff of the Museum's Anthropology Division, and Mr Paniza of the Geology Division. Excavations began immediately when supplies and equipment arrived; many were donated by private persons, and also by the Research Foundation in Philippine Anthropology and Archæology, Inc.

At the present stage, I can only make a preliminary statement about the Palawan excavations, which are still going on; it is possible that new data will precipitate changes in interpretation.

On hand we have a wide range of distinct assemblages recognized on the basis of the finds from excavations proceeding in various stages in the caves of Lipuun and Iwa-ig. Seen as a whole the oldest materials appear to be late Pleistocene and the latest are associated with trade ceramics of 12th–13th century date. Hundreds of cultural and skeletal materials (mostly broken) have been recovered; many hitherto unknown to Philippine archæology. In a series of green jade ornaments, is a carved pendant with double-headed carabao motif; there are also adzes of ground giant clam *(Tridacna)* shell; a flexed early neolithic burial (Pl. I*a*); a clay mould for a decorated bronze mace or axe, and so forth.

The most exciting cave to date is Tabon Cave (Pl. I*b*), named after the Tabon bird or Philippine Mound Builder *(Megapodius freycinet cumingii)*. It digs deep holes in the guano to deposit its eggs, and is thus responsible for the slight random disturbance of the cave deposits.

The fossilized human and animal bones, including a human skull-cap, discovered in Tabon Cave, have been reported in several newspapers and magazines, local and foreign.

The cave which is about 110 feet above sea level, is 8 metres high, twice as wide, and 38 metres deep. Its long chamber is well lit, airy and mostly dry, making it ideal for habitation and burial. Its multi-coloured and multi-textured bands of successive deposits reach 5 or 6 metres deep according to estimates.

A preliminary evaluation of the geology of Lipuun would indicate that Tabon Cave is old enough to contain mid-Pleistocene artifactual and non-artifactual remains. Hence the tentative dating, from finds including fossil human remains and one flake tool industry, is 15,000 years B.P. That certain fossilized bones and antlers are suspected to be those of deer is significant, for according to Fox, Palawan proper has no deer today.

The initial finds at Tabon appear to belong to two general groups of depositional activity: a secondary jar-burial assemblage and two (possibly three) flake-tool industries. Judging from the hundreds of large sherds of jars on the surface, Fox believes that the present floor of Tabon Cave is probably the same floor on which they were originally placed. The pottery complex shows similarities to the Sa-huỳnh pottery of Indochina (*AP* 3, 2, 1959), 'suggesting that a jar-burial complex came into this area from Indochina, but that the Palawan potteries are in some cases pre-iron in date'. Among the pottery forms were round-bottom burial jars with constricted waists and flaring lips, the truncated lids fitting within the lit of the jar and sealed to the lower jar with lime; a generally low-fired, heavy pottery, both unpolished and undecorated, except for rare instances of decorations with carved or cord-wrapped paddles and so forth. The size of the jars suggests a 'secondary jar-burial complex'. Bones of infants, children, and adults have been found near the jars, and in one instance the bones of a child was found inside the jar.

There were relatively few cultural materials associated with the jar-burials of Tabon Cave and these included a half-piece bracelet; nephrite and glass beads; fragments of copper (?) tools, etc. As no iron or ground stone implements were found Fox believes that the assemblage belonged to the chalcolithic, a stone-using to metal-using transitional period.

So far, the excavations have revealed more than one series of chert-flake tools, which vary greatly in age according to the stratigraphic evidence. What makes Fox think so is the abundance of chert on Palawan and the fact that the cave is ideal for habitation, although later on, during the pottery period, the cave was used for burial. The following is the delineation of the flake-tool assemblages as identified by the excavation team:

a. Flake Tool Assemblage I and the Flake Tool Workshop where chert flakes were found on the surface, in nearby disturbed holes of the Tabon bird, and in anciently disturbed soil which is hard, granular and brown in colour that forms a present surface of the cave in only 3 four-metre-square trenches. The latter hard soil contained only a number of large and tiny flakes associated with fossil human and animal bones;

b. Flake Tool Assemblage II, found along the north wall in two squares in the guano beneath hard calcareous floors. In quality and colour, the cherts here are different from the other assemblage and are probably much older and;

c. Flake Tool Assemblage III, discovered so far in one square in a soft, fine, red-brown deposit. The relationships that this band has with the two other assemblages have not yet been established.

Carbon-14 Age Determinations. To check the present calculated guestimates based upon typological and morphological comparisons, the Museum has sent some charcoal samples to the University of California at Los Angeles for analyses through the intercession of Dr Richard Shutler Jr, of the Nevada State Museum.

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II

Polynesia*

Y. H. SINOTO

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In recent years our knowledge of Polynesian prehistory has been greatly expanding, and 1962 marks the most extensive field work ever undertaken in the island groups of Polynesia. Two important scientific reports on results of earlier excavations were published in 1962: one by Robert Suggs, *The Archæology of Nuku Hiva, Marquesas Islands;* and the other by Thor Heyerdahl, Edwin N. Ferdon, Jr, William Mulloy, Arne Skjolsvold and Carlyle S. Smith, *The Archæology of Easter Island.* Bernice P. Bishop Museum, in co-operation with New Zealand archæologists and supported by the National Science Foundation, launched a three-year programme of Polynesian archæological research in the Society Islands, American Samoa, and Rarotonga in the Cook Islands.

The American Museum of Natural History sent a party to continue the field work of 1960 in Opunohu valley on the island of Moorea, Society Islands. The University of Madagascar began a preliminary survey and test digs on the island of Rurutu, Austral group.

In the Hawaiian Islands, Bishop Museum under contract with the National Park Service conducted a site survey and test digs on the island of Maui and salvage excavations on the island of Hawaii. The University of Hawaii conducted site survey and excavation on the island of Oahu.

FIELD WORK

Society Islands

Research in the Society Islands was conducted by Kenneth P. Emory and Yosihiko H. Sinoto, Bishop Museum, Honolulu, from May to October 1962; it was the third expedition sent there by the Bishop Museum since 1960.

The most significant discovery of a Pre-Moa hunter (tentative term) burial was made on the tiny island of Maupiti, thirty miles west of Borabora, during the last expedition. A local planter, in digging post-holes for a boundary fence on Motu Paeao (one of the coral islets on the fringing reef), uncovered a human skull with two whale-tooth pendants and an adze, and gave them to Monsieur Schmidt (a medical practitioner at that time on the island) who showed the artifacts to the Bishop Museum party in Papeete. Realizing their importance, Sinoto left immediately for Maupiti with Aurora Natua of the Papeete Museum. Working with the local people on Maupiti, Sinoto expanded the post-hole and found an extended burial of a male with two more adzes on his chest, a small whale-tooth pendant, a human tooth pendant, and five pearl-shell bonito hook shanks and a point. The types of artifacts, the burial complex, and their authenticity definitely show a close resemblance to those of the Moa-hunter burials of South Island, New Zealand. This discovery sheds light on the early movements of the Polynesian people, not only between the Society group and New Zealand, but also between the Societies and Hawaii. The preliminary report on the Maupiti burial will appear soon in the *Journal of the Polynesian Society*.

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* For information and help in assembling this section I am grateful to Lloyd Soehren and Marion Kelly, Bishop Museum; Roger Green, Auckland University; and Pierre Vérin, University of Madagascar.

In the ancient fishing village at Afareaitu, Moorea Island, two months of extensive excavation were conducted by Sinoto with the assistance of Miss Marimari Kellum, University of Hawaii student. The site is located on the flat coastal area and extends from east to west about 500 metres. Among the structures uncovered were house sites and several *marae*, most of the latter destroyed and only upright stones indicated their existence. At its eastern end, a small feasting platform was excavated; test pits around it had been dug in 1961. Stone house foundations, midden material, and fireplaces were found in the two occupation levels below the surface. Charcoal samples were collected and dated by the radiocarbon method. The earliest date, TRC–8, A.D. 1022 ± 90 years (Gakushuin–218) came from a sample collected at the 30 cm. level in the test pit No. 13. The date indicates roughly the age of the early period of Afareaitu site, but so far, we have no other criteria to confirm it.

In 1962, excavations were concentrated on the western end of the site. We sought places which would produce quantities of fishing gear and manufacturing tools, such as fishhooks and files, for comparison with those of other island groups and especially of Hawaii. As we had no surface clues to detect kitchen midden or workshops, we drove over 350 small test holes systematically in the area around the house sites and *marae*. From the quantitative and qualitative analysis of shell remains recovered from these holes, 42 two-metre squares were expanded. Concentrations of fishhooks and blanks with coral files were observed around groups of set stones (probably workshops) and fire-places. Grindstones and hammerstones were found in and around the groups of set stones; some were probably base foundations for house posts. A ditch, probably a drain, found in the excavation, extended below the water level and several artifacts were recovered under water. The accumulated cultural deposit was shallow, about 30 cm., and there were no distinct cultural layers.

Of the two excavated *marae* sites, one still retained its *ahu* and wall foundations; the wall stones had been removed to build a road and wharf. Its excavation revealed that it rested on a former living area. A fire-place was found below the wall foundation and charcoal pieces scattered beneath; a charcoal sample is now being dated. Among the artifacts recovered were a human bone chisel and several conus-shell chisels, fishhooks, stone and coral files, and grindstones. Some artifacts were found in the fill of the walls. From this excavation we found the first Tahitian dog skull, with other parts of the skeleton, from under the court pavement. A total of eleven human skulls, some of them associated with skeletons, were found inside and outside of the *marae* and under or between the paving stones. Besides the skulls, a bundle of human long-bones was found under its southwest cornerstone. One of four skulls found in a pit appears to have a bullet hole and some stones used for paving were dressed wall-stones. This would indicate that not all of the skulls were of the same period. It is possible, that the bundle of bones is the remains of a human sacrifice offered at the time the *marae* was constructed. The excavation of the *ahu* revealed that the *marae* was rebuilt later and cut curb stones added in front of the old *ahu*. A rectangular, paved house-foundation with post-holes was found along the outside of the east wall of the *marae*.

In spite of extensive excavations in Afareaitu, few artifacts (about 300 artifacts, including over 80 adze chips) were recovered; this small number is quite usual for Society Islands' sites. The Afareaitu excavation has nevertheless added to the material culture of Tahitian prehistory.

At the end of August, the Bishop Museum party moved to Opoa, Raiatea Island, where it cleared, surveyed and mapped Marae Taputapuatea, and partly reconstructed the wall by replacing some of the fallen *ahu* slabs. Taputapuatea, one of the largest *marae*, was once the most important religious centre in the Society group. Kenneth P. Emory, who surveyed the site in 1926, thirty-six years later found it in almost the same condition but covered with a dense growth of trees. The *ahu* is 42 metres long, 9 m. wide and 2·5 m. high at the top of the fill; some of its coral slabs are 4 m. high and 2·5 m. wide at the maximum, and 0·4 m. thick. Emory and Sinoto found that the fill of the *ahu* is supported by the primary *ahu* slabs and the outer slabs are simply leaning on the primary slabs.

Several test pits were put down outside of the *marae* court. Two pits revealed the existence of a coral gravel floor under its present court; in one pit a considerable amount of broken human bone was found with charcoal.

Outside and toward the northwest of the *marae* was a large rectangular platform (which had been taken for a priest's house platform). Directly beside it an archery platform was discovered, the first ever found in the Leeward Island Group. Later, another archery platform was found in Opoa valley. Further research and excavation will be carried out in Opoa in 1963.

In June, Sinoto conducted a week of preliminary prospecting on Huahine; surface findings were poor except for *marae*. Matairea Hill behind Maeva village has a promising area for excavation. Here a considerable amount of shell deposit was noted by Emory in his 1926 survey; Sinoto in testing the area confirmed the deposit. In 1926 Emory had surveyed and recorded all the names of the approximately thirty *marae* in Maeva village; they were still intact in 1962, but the present villagers can only recall half of their names.

Roger Green and Janet Davidson of Auckland University did field work sponsored by American Museum of Natural History. They excavated *marae* and house sites in Opunohu valley, Moorea island, from December 1961 to March 1962. They concentrated their attention on the stratigraphy of selected sites in the interior of the valley. Two *marae*, a large round-ended assembly house, and a small rectangular house were excavated; test diggings were made on four *marae* and a small round-ended house.

Site ScMo-158 (a large round-ended assembly house) showed, on excavation, an occupational sequence and stratigraphic association of the various stone remains. Green's account of the stratigraphic sequence is as follows:

Stage a. Pit and post-hole stage, which shows numerous storage pits, post-holes, and several drains cut into sterile clay.

Stage b. Deposit of clay fill derived from disturbed, sterile soil and mixed with a small amount of charcoal. This stage marks the creation by the cut-and-fill method of a flat dwelling area.

Stage c. Accumulation of a more friable, heavily charcoal-impregnated, black fill.

Stage d. Building of a stone terrace wall at the front of the site, infilled at the back with additional, redeposited black fill. During this stage the 45 foot-long assembly house, the long terrace with uprights behind it, and the simple, stone *marae* were constructed.

Stage e. Abandonment or demolition of the assembly house and the construction within it at the west end of a small rectangular sleeping house.

Green collected a large number of excellent charcoal samples which will permit the radiocarbon dating of each stage.

Site 103*c* (a large pavement and small rectangular house) has a four-stage sequence very similar to that of SoMo-158. In its third stage, the dwelling area was enlarged and a 60-foot long round-ended assembly house built. It is the largest assembly house recorded in Opunohu valley according to Green.

Green did not find a single artifact of bone or shell in his excavations; and although no significant midden deposits were encountered because of acidity of the soil, some bone remains of pig and dog were discovered in the excavations of the sites. Only 26 broken adzes or fragments, 1 stone pounder, a cache of 25 sling stones in the wall of a *marae* (ScMo-1031), and several single sling stones in *marae* sites were recovered in the three months of research.

Three coral slab boxes inside the *marae* revealed nothing to indicate their function. Green's investigations around and under the uprights gave no new information on the position markers for gods, ancestors, and ceremonial participants on the *marae.*

Austral Islands

During September and October Pierre Vérin, Attaché au Département d'Art et Archéologie de l'Université Madagascar, with the help of Miss Marimari Kellum, University of Hawaii student, made an archæological survey of Rurutu in the Austral Islands. In this comprehensive survey of the most prominent surface ruins of the islands, they discovered in the northern part of Vitaria district an old urban complex, which was cleared, surveyed, and mapped. Vitaria contains more than fifty house sites, platforms with specialized functions, and several *marae.* The house sites belong to the round-ended type and are set up on rectangular, elevated platforms; the fronts of the latter are paved and show a line of uprights parallel to the curb of the houses. Rurutu *marae* are of several types. Some resemble the Tubuaian *marae,* the square-court type with lines of uprights on three sides and without *ahu* as has been described by Aitken (Ethnology of Tubuai, *Bishop Museum Bulletin* **70**, 1930, 118). Others have only an *ahu* but no enclosed court or uprights in a court and are similar to those of the Society Islands and the Tuamotus.

Others again are a combination of both preceding types, a square or rectangular court with three sides of back-rests and an *ahu* on the fourth side.

One reason for the perfect preservation of the Vitaria ruins is that the site was completely abandoned before the Christian epoch; when Teaurea, the district chief of Vitaria, became the king of the whole island of Rurutu he moved the capital to Moerai where extensive cultivation of taro was possible. In the three main villages of today, Moerai, Hauti, and Avera, none of the ancient remains are in good condition, but the urban pattern of life and the social unit of the prayer house within the village may be a continuation of the older pattern.

In Nauru district a large cave was tested and may be a well worth excavation. The first pearl-shell hooks from the Austral Islands were found here as well as adzes, a shell chisel, and scrapers. A charcoal sample for radiocarbon dating has been sent to Gakushuin University laboratory.

The expedition was financed by the University of Madagascar; M. Bertrand Jaunez of the Société des Études Océaniennes, Papeete; and the Bishop Museum, Honolulu.

Vérin intends to return in the summer of 1963 to excavate in the Nauru district cave and the Vitaria village complex.

The Cook Islands

A team of New Zealand archæologists, headed by Roger Duff, Director of Canterbury Museum, Christchurch, went to Rarotonga to begin a site survey and excavations in November 1962. The Bishop Museum provided the necessary funds from a National Science Foundation grant for Polynesian Archæology and expects to receive in due course a report from the team.

Hawaiian Islands

In 1962 the field season in archæology began with a site survey of two large tracts of land in North Kona, Island of Hawaii. Lloyd Soehren, Bishop Museum, surveyed and recorded a number of surface remains, but found no significant stratified sites. Similar surveys made in other parts of the island by Mrs Violet Hansen, Bishop Museum Field Associate, has added extensively to the inventory of surface remains on the Island of Hawaii.

To evaluate and possibly salvage a much eroded shoreline site on State land at Puako, South Kohala, Island of Hawaii, Lloyd Soehren, Violet Hansen and Marion Kelly, spent about three days in June excavating two test pits, with the help of local residents. Field expenses were covered by a grant from the University of Hawaii Committee for the Preservation of Hawaiian Culture.

In July Soehren made a site survey in Kaupo on the southeastern part of the Island of Maui, as part of a contract with the National Park Service. Further surveys and several test excavations were made later in the year in the dormant crater of Haleakala, Maui. A final report will be submitted to the National Park Service in 1963.

In August, at City of Refuge National Historical Park, Honaunau, Kona, Hawaii, a salvage excavation of a stratified but shallow camp site on the beach was conducted by Soehren, again under contract with the National Park Service. A qualitatively interesting collection of artifacts was recovered, but slight in quantity and antiquity. The final report was submitted in January 1963.

In October 1961, the Department of Anthropology of the University of Hawaii began a field survey at Hawaii Kai on the southeastern end of Oahu. Several small sites were located, including a small rock shelter, the outer side of which looked like a coloured layer cake from the alternating layers of shell, ash, and dirt mixed with charcoal which recent erosion had exposed. Excavation of the site was started in February 1963 as a part of a class on archæological field method, under the direction of Wilhelm G. Solheim II. Once trenches had been cut across the face and to the back wall of the site excavation proceeded by following the natural layers. Extensive pitting was found in the top 30 to 50 cm., several times resulting in pits within pits. A charcoal sample, taken from the bottom of the third layer and submitted to Gakushuin University, gave a date of 1,330 ± 150 A.D. Two more samples, one from the bottom layer and one from the second layer above the dated layer have been submitted. Numerous artifacts were recovered from the top levels but very few from the lowest five levels.

American Samoa

In October-November 1962, a preliminary archæological site survey of Tutuila and Marua Islands, American Samoa, was undertaken by Y. H. Sinoto, Bishop Museum, and William Kikuchi, University of Hawaii graduate student. Earlier, Kikuchi as part of his graduate work spent nine months on a site survey of Tutuila. This visit of Sinoto and Kikuchi marked the beginning of the work in American Samoa under the three-year Polynesian Archæological Research Programme supported by the National Science Foundation.

Limited by time and transportation, the survey was around the southwestern coast of Tutuila and on Tau Island, Manua Group. Dense vegetation covered the coastal area and hampered prospecting; it contrasts with the openness of the Western Samoan terrain. Tia, or earth mounds such as Golson excavated in Vailele near Apia, Upolu, so far have not been found in American Samoa. Abandoned house platforms and cultural deposits with charcoal were tested in Leone village. Stone adzes and graters were discovered in some of the test pits, but post-European materials were also found throughout the deposits in all the test pits, except one house site, where the lower layer contained no post-European material. A test dig in the floor of Bat Cave near Pago-Pago showed two separate ash layers; this may prove a promising site for excavations. A charcoal sample was collected from the test pit for radiocarbon dating. A large cave behind Faleasao village, Tau Island, was used as refuge during a storm in historical times, but a test excavation, one metre deep, in the cave floor showed no evidence of human occupation, except on the surface. The ancient village of Fanga, now abandoned, was the first settlement in all Samoa, according to Samoan legends. Numerous house platforms and foundations are overgrown with bushes and trees. Many ancient Samoan sites probably lie under present villages; only where villages have been abandoned can extensive excavation be done.

Although stone artifacts were found in large numbers on the surface, not a shell or bone artifact was picked up. In two villages (Leone, Tutuila Island, and Fitiuta, Tau Island) alone, over 250 classifiable adzes, adze sections, and numerous adze fragments as well as 95 stone graters were found. Kikuchi had already found 50 adzes in Leone on his previous trip. All the artifacts were found on present house platforms of the villages or on the village roads. The types of adzes include all of Buck's 8 types (Buck 1930) and 7 adzes of the Tongan type. A triangular adze found in Fitiuta village has a distinct tang with sharp shoulders; similar to the type of the Cook Islands. Besides this tanged adze, there are several adzes which indicate incipient reduction by flaking off the sides of the butt near the poll. Tanged adzes all come from the surface and are few in number; future stratigraphic excavations in this area may reveal whether tanged adzes were developed in Western Polynesia or represent an intrusion from Eastern Polynesia in later contact times.

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12

New Zealand

OWEN WILKES

INTRODUCTION

The reports on New Zealand in previous issues of *Asian Perspectives* show that the study of its prehistory recently was pursued mainly through the discipline of archæological excavation, and this continues to be the case. Archæology at the present time shows two overlapping trends: *(a)* an emphasis on the excavation of structures, mainly pits; and *(b)* the development of new dating methods and setting up of chronological sequences based on traits other than the morphology of portable artifacts. These trends are evident in the two chief communication outlets provided by the New Zealand Archæological Association: the biennial conference and the *Newsletter*.

The 1962 conference, held in Christchurch from 10 to 17 August, in conjunction with the Royal Society of New Zealand Tenth Science Congress, included a lecture and two-day field trip to view rock drawings, symposia on cultural successions in the North and South Islands, on Holocene History (in conjunction with Geology, Geography and Soil Science sections) and on Oceanic prehistory, as well as papers on archæological field work and material culture.

The *Newsletter*, in five years has grown from a modest sheet to four quarterly issues forming a 250-page volume of interim reports and extended summaries of field work. The number of persons and the strength of field groups whose reports appear in the *Newsletter* continue to increase. The bibliography of articles in my present report is largely taken from the *Newsletter;* it shows that current publication is rather unbalanced; detailed final reports are slow to appear, because few institutions are willing to support final, full publication.

CULTURAL SUCCESSION AND CHRONOLOGY

A symposium was held on the subject of cultural change at the August conference. Partly in an attempt to meet Golson's demand (1959) for a more flexible nomenclature, Duff proposed (1962, 1963) a modification of his earlier bipolar scheme (1956) to allow between his Moa hunter and Classic phases, a Transitional phase divided into 'Residual' and 'Protoclassic'. This scheme, which continued to apply an economic term (Moa-hunter) to a cultural entity, was followed by Green's more specifically defined cultural sequence for the northern part of New Zealand, which is likely to become a model for successions elsewhere (Green and Shawcross 1962). The subdivisions are defined not by the durations of traits but by the incoming of traits, and ecological and economic traits are given prominence. A summary of this sequence is as follows:

1. *Early European Maori Phase; c. A.D. 1800–1850.* A fusion of Maori and European culture, settlements form the differentiated simple nuclear *pa*, often modified by new warfare methods.

2. *Classic Maori Phase; c. A.D. 1650–1800.* Culture as defined by Duff (1956) and Golson (1959). Intensive systematic agriculture. Differentiated simple nuclear *pa.*

3. *Village Maori Phase; c. A.D. 1450–1650.* A 'transitional' or 'proto' form of Maori culture. Systematic agriculture. Semi-permanent sedentary *pa.*

4. *Experimental Phase; A.D. 1350–1450.* A late stage in the development of New Zealand Eastern Polynesian Culture, experimental development of agriculture, the moa becoming scarcer.

5. *Developmental Phase; c. A.D. 1100–1350.* New Zealand Eastern Polynesian Culture (i.e. the 'Archaic' of Golson [1959] and 'Moa hunter' of Duff). Intensive exploitation of moa.

6. *Settlement Phase; c. A.D. 900–1100.* Initial adaptation of a tropical East Polynesian Culture to the New Zealand environment.

With a sizeable body of data on pit structures now available, R. H. Parker was able to present to the N.Z.A.A. conference a tentative sequence of Archaic pit types which have been excavated in two widely separated areas in the North Island. These types are summarized from Parker (1962) as follows:

Archaic A: (a) Deep pits with length: breadth ratio 3:2, sometimes with a single buttress on one long wall and/or a scoop hearth. Two post-holes well in from the end walls. *(b)* Flat roofed rectangular underground pits.

Archaic B: (a) Shallow pits with 2:1 length: breadth ratio and a central line of post-holes with end posts recessed into walls. *(b)* Small bin shape pits.

'Early Maori', 'Classic Maori' and 'Late Maori' periods complete Parker's Sequence.

A comparison between tree ring dating and C_{14} dating has shown recently an error probably in the latter method due to variations in C_{14}/C_{12} ratios in the atmosphere. The errors agree roughly with those given by similar work in the United States. The method used was to count rings on a section of a 1,000 year old kauri tree, and then carry out C_{14}/C_{12} determinations on 15 samples from the section. A table of ring dates, C_{14} dates and probable necessary corrections for the latter, after Jansen (1962) is as follows:

Ring Date A.D.	C_{14} Date A.D.	Differences (correction for C_{14} date)	Ring Date A.D.	C_{14} Date A.D.	Differences (correction for C_{14} date)
1031	691	340	1534	1414	120
1032	755	277	1570	1535	35
1091	783	308	1592	1583	9
1099	872	227	1595	1617	−22
1177	939	238	1696	1740	−44
1246	1039	207	1696	1738	−42
1390	1200	190	1786	1865	−79
1489	1349	140			

These corrections are not being applied in published C_{14} datings by the N.Z. Institute of Nuclear Sciences until the discrepancies are confirmed by further work.

Chronology by obsidian dating relies on measuring the thickness of the hydration layer of obsidian flakes, which is proportional to the lapse of time since the flake was knapped. Two recent articles (Ambrose and Green 1962, and Green 1962) describe the progress made with this method in New Zealand—local factors such as obsidian source and average soil temperature must be taken into consideration.

Field work data continue to set back, as might be expected, the date for the first human occupation of New Zealand. A summary of stratigraphic evidence for a considerable peopling of the North Island, at a much earlier date than was previously thought, was given in *AP* 5, 94. A full report, with further data and conclusions, has now appeared (Wellman 1962).

Wellman subdivides the Holocene Period and its deposits in the North Island as follows:

1. *Several thousand years B.C.* Last cool period. Sea level significantly lower, marked by drowned forests, etc.

2. *Several thousand years B.C. to A.D. 200.* Deposits beneath the Taupo pumice shower, including several ash showers.

3. *A.D. 200 to ? A.D. 550.* Deposits between the Taupo pumice and the lowest charcoal fragments.

4. *? A.D. 550–A.D. 700.* Oldest layers with evidence of human occupation—charcoal fragments.

5. *A.D. 700–A.D. 1300.* On the East Coast—lower occupation layers and lower part of overlying barren layers. In Coromandel—Northland—deposits with moderately abundant charcoal. Base defined by Loisel's pumice. (However, elsewhere in the Paper, Wellman admits that this method of 'stratigraphic' dating gives possible dates between A.D. 500 and A.D. 1000 for the Loisel's eruption.)

6. *A.D. 1300–? A.D. 1800.* Upper occupation layers, and on the East Coast, part of the relatively barren layers below. Base defined by a volcanic ash layer, probably Kaharoa Ash, carbon dating elsewhere as A.D. 1050 although the 'stratigraphic' date is 1350.

7. *A.D. 1800 to present.* Mainly windblown sand or soil and mud flows. Disproportionately rapid accumulation presumably due to destruction of plant cover.

Assuming a Maori population of 250,000 in 1780 (based on estimates by Captain Cook, etc.) Wellman compares 'intensities' of the two occupation layers and estimates a population of 150,000 for the A.D. 700–1300 layers. Between this and the post-1300 population, Wellman sees a reduced population due probably to scarcity of the moa and the unsuccessful cultivation of the kumara. If the population had doubled every 20 to 50 years, the first 100 or so people would have arrived between A.D. 200 and 500. Absence of any sign of occupation for a long interval above Taupo pumice makes it unlikely that North Island was inhabited in A.D. 200. Wellman points out that the traditional arrival of 9 fleet canoes in 1350 was unlikely to dominate a culture which already numbered 150,000 in A.D. 600.

Other workers, in the Waikato region and in Hawkes Bay, have produced uncertain evidence (as yet unpublished) for man's presence before the Taupo Pumice Shower (*c.* A.D. 150). More definitely, a post butt in Redcliffs Cave, South Island (see Bell, 1958) has been carbon dated at A.D. 780 ± 65 (Duff 1963).

CLIMATE CHANGE AND THE KUMARA

The theory that the sweet potato or kumara was a late (1350- Fleet) introduction to New Zealand and that it was unknown in Moa-hunter (Duff 1956) times is now being carefully re-examined. It was originally put forward on the evidence of tradition, but is difficult to prove or disprove as wooden agricultural implements are unlikely to be preserved, and pollen is rarely if ever produced by New Zealand plants. Small bin-shaped pits, too small to be house pits, have been interpreted (Golson and Gathercole 1962) as storage pits for kumara. Several of these were excavated at three Development Phase sites (Green 1962) on the Coromandel Peninsula, two of which are carbon dated A.D. 1300–1350. On D'Urville Island a layer of pebbly soil associated with occupation layers containing midden moa bone and East Polynesian artifacts has been interpreted by Wellman (1962*a*) as a 'made' soil for kumara culture. (We know that in historic times Maoris added pebbly material to soil to improve its tillage, drainage and heat retention qualities.) The occupation is 'stratigraphically' dated at A.D. 1000. At a North Island site Wellman (1962*b*) has made an uncertain correlation of supposed 'made' soil with his A.D. 700–1300 occupation layer.

If we accept that the development of soil improvement techniques and storage methods (unnecessary in the rest of Polynesia where year-round cultivation was possible) took a considerable time, then the kumara might well have been introduced well before A.D. 1350.

Another well entrenched theory, which has been critically re-examined, is that of a climatic change from about A.D. 1200, to the present, with a drop in mean annual temperature of 4–5° F and concurrent dessication. It was based on numerous grounds, mainly non-archæological, such as anomalous distribution of mesophytic rain-forest and other forest types in Southern New Zealand (Holloway 1954). The idea of a warmer, moister climate 700 years ago has been adopted enthusiastically by archæologists to explain: *(a)* the ease with which ancestral Polynesian immigrants adapted themselves to New Zealand's high-latitude environment; *(b)* the selection of suitable kumara strains and the gradual invention of tuber storage and soil improvement techniques as climate deteriorated; *(c)* the probable cultivation of kumara south of its present limit; *(d)* the rapid extinction of the moa.

Cumberland (1962*a*), after examining all the data invoked to support climate change and rejecting some of it, re-interpreted much of the data to support the view that climate changes were very slight, with a slight cooling and increase in precipitation. Of this he gave additional evidence from overseas and from a general consideration of the physics of climate. Again following the lead of recent overseas studies (this time on the effectiveness of primitive cultures in changing their environment), he says that the changes of flora in the last 1,000 years are due not to climate change but to large scale burning of the vegetation by the moa-hunters, perhaps to increase the area of grassland and thus attract more moas, or to round up and kill the moas. Robbins (1962) has shown by means of forest profile diagrams that recent climate change need not necessarily be invoked to explain forest patterns.

FIELD WORK

Field work which the N.Z. Archæological Association has been directing and co-ordinating in an informal way, is now divided into the extensive recordings and the surveying of surface evidence, which data is incorporated in the Associations' Site Record files, and the intensive excavation of selected sites. Numerous articles (see Smart, 1962*b* for a good example) in the *Newsletter* record the progress of site surveying and the results obtained by independent workers and groups in their own areas throughout the country. The Association's files are now becoming sufficiently complete to enable it to make recommendations for legislative protection and for the excavation (under control) of sites selected for reasons of expediency, of theoretical importance, or likelihood of destruction, etc.

Among the many current excavation projects, one is by Auckland University Archæological Society at Kauri Point in the Bay of Plenty. In an interim report, Ambrose (1962) describes the following sequence of deposits, structures and events:

1. Construction of three small isolated rectangular pits later sealed in by a mixed gritty and sandy layer which had accumulated through human agency.
2. On terraces cut on a slope adjacent to the *pa* site and on the flat above were several pits arranged in orderly pattern: 20 by 11 feet in size; some had scoop hearths, and all regular post-hole patterns. Defensive works with a 6 ft. wide flat-bottomed ditch were backed by a 9 ft. high bank with massive post-holes. Probably formed in the same period was a shell midden 6 ft. thick.
3. Accumulation of a burnt, broken shelly formation.
4. Construction of a new ditch and bank defence system, similar to the earlier one.
5. Construction of a new ditch third-defence system with a double ditch and bank unit, the inner ditch was similar to that of period 3; the outer was an innovation and of different shape. No evident palisade post-holes. It was also characterized by over pits, small irregular pits, some containing human remains, and large numbers of post-holes.

Due to the paucity of artifactual material and the lack of comparable data from other sites, Ambrose does not attempt an outside correlation of his periods, for he says, 'ascription of titles such as Archaic and Classic Maori is bound to be a hazardous enterprise'. Since Ambrose's report, further excavation has been carried out on the *pa*, in the adjacent swamp and at a nearby village site.

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1962*b* Excavation of a house-floor at Waimate Pa, *NZAA Newsletter*, 5(3): 184–187. ⌐Description of a late Maori house-floor compared to a temporary description of habitations on the site in A.D. 1834.

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1962*b* Excavations on Mt. Roskill, *NZAA Newsletter*, 5(1): 81–83.↩Brief description of 16 pit structures, showing 4 basic post-hole patterns.

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1962*a* Midden recording and sampling in the Waikanae region, *NZAA Newsletter*, 5(3): 160–169.↩Methods used in a recent survey of predominantly molluscan middens and applicable elsewhere are described. They are designed for subsequent punch-card analysis.

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Melanesia

RICHARD SHUTLER JR

Received 1 April 1963

The information on Melanesia was gathered from various sources covering the general period from June 1961 through December 1961.

FIELD WORK

Richard F. Salisbury, University of California, Berkeley, returned in January 1962, from a field trip to the Siane in the eastern Highlands, New Guinea. He also studied processes of economic change among the Tolai people of the Gazelle Peninsula.

Ann Chowning (Barnard College, Columbia University) and Jane C. Goodale (Bryn Mawr College) will be doing ethnographic field work in the interior of southwest New Britain, working respectively with the SENG SENG and KAULONG linguistic groups. The work will be carried out between June 1963 and September 1946: following up a preliminary survey in July–September 1962. They will be doing general ethnography, with particular attention to social organization, religion, and subsistence. (The groups are pacified but the interior villages have not come under intensive mission influence.)

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14

Australia

FREDERICK D. McCARTHY

Received 25 February 1963

1962 was a year of notable expansion in archæological field work in Australia, due mainly to the Australian Institute of Aboriginal Studies. This Institute granted funds to R. Wright and V. Megaw, University of Sydney, to excavate sites in the Sydney-Hawkesbury district; to Miss I. McBryde, University of New England, for archæological work in northeastern New South Wales; to J. Golson, Australian National University, for survey and excavation work in southern New South Wales; to I. Crawford, Western Australian Museum, to excavate the Wilgi-Mia red ochre quarry; to R. Wright, University of Sydney, for reconnaissance and excavation work in northern Cape York; to C. P. Mountford to study art designs in Northwestern Australia; and to Mrs T. Kemp to study Tasmanian stone implement typology. The Nuffield Foundation granted D. J. Mulvaney, University of Melbourne, funds to carry out a comprehensive survey in Arnhem Land. Dr D. J. Tugby, University of Queensland, is planning a survey of sites in southeastern Queensland. All the above field work will make significant contributions to the archæology of the east coast of Australia. The areas which remain to be investigated are the central and north coast of Queensland, the lower north coast of New South Wales, and the eastern Victorian coast. We hope that Mulvaney's survey will give us radiocarbon dates of sites excavated by the American-Australian Expedition to Arnhem Land in 1948.

ROCK ART

The most important series of papers published on Australian archæology during the year dealt with rock paintings and engravings. Arndt described six caves of paintings in the Sickness Country of the Djauan tribe in southern Arnhem Land. They illustrate the mythology and laws of the cult hero Nagorkun, and the annual initiation ceremonies associated with the sites. The author pointed out that although the cult is probably very old, the paintings do not go back more than 90 years. Arndt, in another important paper, gave a new interpretation of the Lightning Brothers painting at Delamere, Northern Territory. The recording of cave paintings and their interpretation, with the associated mythology, is a most urgent field of investigation in Australian archæology, and a great deal of such work remains to be done in northern Australia where informants are still available.

McCarthy's description and analysis of the enormous range of motifs in the rock engravings decorating some eight miles of sandy limestone ridges at Port Hedland in northwestern Australia revealed the presence of three techniques—abrading, conjoined punctures and pecking—and a sequence of three phases of engraving—in outline identical with the Sydney-Hawkesbury and Burra engravings in southeastern Australia; the linear design, and the pecked intaglios. Both of the latter phases are known from over a vast region of the interior of the continent from northwestern Australia to western New South Wales and the Flinders Ranges in South Australia. This sequence of phases will have an important bearing in interpreting all future sites; it has already shown that the linear-design ritual art of living tribes in central Australia is a survival from prehistoric times. McCarthy and Macintosh made a similar analysis of the Mootwingee site in western New South Wales, where the pecked intaglios are predominant and illustrate hunting, ritual and fighting themes. Information from an old full-blood aboriginal, George Dutton, links the site with the Eaglehawk and Crow myth and with rainmaking. Macintosh in this study analysed in detail one of the most interesting engraved rock surfaces yet recorded in Australia. Typical Tula culture implements were found in two floors excavated in a number of rock shelters containing stencils and simple silhouette paintings. Superimpositions at both Mootwingee and Sturt's Meadows of pecked intaglios over linear designs corroborate the Port Hedland sequence of changes in rock engravings during prehistoric times in Australia.

Mountford and Edwards described three engravings—the famous 'Crocodile' head, barred fish and pecked intaglio turtle (sic)—as examples of extinct creatures which must have been engraved when the sea was much closer to the Flinders Ranges than at present. It is also claimed that the pecked engravings were done before the dingo reached Australia because we have no engravings of them in South Australia or western New South Wales. Such assumptions demand careful analysis before we can accept them. It is not uncommon for marine subjects to be engraved or painted far inland, as Macintosh has shown for Tandandjal in southwestern Arnhem Land and myself for the Sydney-Hawkesbury district; engravings of sting-rays and turtles occur on Gallery Hill, 100 miles inland from Port Hedland. Pecked intaglios of dingoes occur on Depuch island, at Port Hedland and Mootwingee, and probably elsewhere, and make it unlikely that pecking ceased at a time so far back as these authors claim. Superimpositions reveal that pecking was the latest technique employed in rock engraving in Australia. The following points should be taken into consideration: the changes in rock engraving art noted above; the differential diffusion of techniques and motifs, which were passed over by Mountford and Edwards; and the identification of the pecked intaglio figure, which to me appears to be a typical portrayal of one of the bigger species of long-necked freshwater tortoises so widely distributed in Australia.

Barnett and Brazenor made an interesting identification of the internal and external parts of various animals featured in X-ray art in Arnhem Land. Lommel published two distributional studies of art motifs: one dealt with the northern and southeastern Australian distribution of anthropomorphs, and the western and central distribution of linear designs, in Australia. But from information published elsewhere linear designs extend into the northwest as far as Port Hedland and sporadically into central and southeastern Queensland. Lommel's other publication is a comparative study which shows the distribution of the X-ray, spiral and hocker in circum-Pacific countries. Sim continued to publish his recordings of outline engravings in the Sydney-Hawkesbury district; while McCarthy and Berndt published summaries of aboriginal art. The records, including unpublished ones, made by the artist Westall on the Flinders expedition of 1801–02 of Groote Eylandt paintings, were reissued in a handsome volume.

EXCAVATIONS AND STONE IMPLEMENTS

Miss McBryde's preliminary review of her survey of the archæology of north-eastern New South Wales revealed important differences between the motifs in the cave paintings and rock engravings in the Clarence valley on the one hand, and the northern Tableland on the other. Her excavation of the Seelands rock shelter in the Clarence valley yielded a surprising result: a ground edge axe underlying an industry of flaked choppers and uniface pebble implements, in turn overlain by microlithic lunate scrapers and points. The radiocarbon dates of 1040 ± 80 B.C. for the microlithic industry, and 1920 ± 120 B.C., for the uniface pebbles, are also surprisingly recent. Bondi points came from the lower levels. It is possible that the inconsistencies in prehistoric industries excavated in Australia will be explained, in many instances, by differential diffusion in time over the vast continent of Australia.

The controversy on the nomenclature of the lower Murray and eastern New South Wales cultures and their phases remains unsolved. While Tindale continues to classify industries from all over the continent by his lower Murray sequence, McCarthy rejects this and has named the whole series the Tula culture, from which he exclude all industries lacking the worn out Tula and Burren adze slugs. A protest on ethical grounds by McCarthy followed the excavation and description of the Noola site by Tindale in an area in which the former had been carrying out an archæological survey for two years. The pros and cons of the case were subsequently discussed in a prominent non-scientific journal which comments on topical matters. The Committee for the Investigation of Quaternary Strand Changes of the Australian and New Zealand Association for the Advancement of Science summarized the work going on in this field in each State; some of the work has an important bearing on archæological work in coastal areas, and included a review of the 1960–62 literature on Quaternary Strand Changes in Australia.

Massola continued to describe aboriginal relics and culture in Victoria in papers about Nargun's cave at Lake Tyers, axe grinding grooves at Gellibrand, some remarkable fish traps at Toolondo, a *pur-rut-thri* type grooved axe with an iron halt, weapons of the Taunturong tribe, and a summary of the social and material culture of the Yaitmathang tribe. Mitchell described implements from fourteen camp sites in southeastern Australia, and a number of unusual and unique implements from various localities. Mrs Amey described a stone arrangement at Mullaley, New South Wales.

ETHNOLOGY

Captain Cook's journal, which has been reissued, includes the ethnography of Botany Bay and the Endeavour River; it was about the latter area that his work has most to do. Rose has some interesting views on the people of Groote Eylandt some 200 years ago; he has estimated the population at about 350, or from 2–2½ to the square mile then on this island with limited animal resources. Marlow summarized our knowledge of the dingo and thinks its most likely ancestor is the plains wolf of India.

Pilling surveyed the work done in the fields of ethnology, linguistics, archæology, physical anthropology, non-human fauna, and history of the Aborigines both in field and laboratory research in the museums and universities, and by laymen, for the period 1954 to 1957. While he ferreted out most obscure notes in newspapers and non-scientific journals, he has missed some of the scientific papers. The review gives the main points of each paper (a list of these is given), a glossary of terms and an index. The volume covers Australia (each State), Torres Strait islands, and Australian New Guinea.

TASMANIA

Reid described two sites of rock markings from Remarkable cave and the Broad river; both sites resemble the markings at Blue Tiers now considered to be tree-root grooves. These and other sites in Tasmania have to be reconsidered to decide whether the markings are man made or of natural origin. Plomley, in two important papers, examined the collections of Tasmanian skeletal material, material culture and archæological specimens in European collections, and also the portraits of Tasmanian aborigines, and assessed their documentation and archival value.

PRESERVATION OF ABORIGINAL RELICS

Although single sites here and there are protected thanks to the efforts of organizations and individuals, nothing constructive or comprehensive in the way of legislation has yet been enacted in Australia. The growing interest in Australian archæology, the tremendous activity in field work, and the wide appeal of aboriginal art, call for protective action. The Australian Institute of Aboriginal Studies is inquiring into the situation in each State, and is initiating the compilation of a central catalogue of aboriginal relics *in situ* all over the continent.

The late Mr Balfour's collection of stone implements was bequeathed to the National Museum of Victoria, and Mr Gresser presented his collection to the Australian Museum. Both collections contain many thousands of implements.

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ARNDT, W.

1962*a* The interpretation of the Delemere Lightning painting and rock engravings, *O*, **32**: 163–77.

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man who had to defend his wife against the taller figure, Yagchadbulla, and the main function of the paintings is to illustrate the moral injustice of Yagchadbulla courting another man's wife. The brothers were not involved in rain making. A comparison is also made with similar figures in other galleries in northern Australia and their interpretation.

1962*b* The Nagorkun-Narlinji cult, *O*, **32**: 298–318.

Descriptions of the paintings in six rock shelters, with which are associated a rock path and mound of bones in an area 30 by 10 miles in extent in Djauan tribal country in southern Arnhem Land. They illustrate the mythological saga of a cult hero named Nagorkun and his wives, the Narlinji women who live with Nagorkun and had enormous powers of procreation. They also illustrate the laws of Nagorkun, and the punishment for disobeying them in any way. Annual initiation ceremonies are held at the sites. The author points out that although the cult may be very old the paintings are probably not much more than 90 years old.

A.N.Z.A.A.S. Committee for the Investigation of Quaternary Strandline Changes

1962 A summary of the work being carried out in this field in the various Australian States, some of which has a bearing on archæological research in coastal areas.⁓Report printed in *AJS*, **25**: 202–5. A roneoed circular (No. 15) reviews the literature on the subject published between 1960 and 1962.

Barnett, C. H. and Barzenor, C. W.

1962 The Australian aboriginal as biological illustrator. *Medical and Biol. Illus.* **12**: 4–11.

Illustrations of X-ray bark paintings from western Arnhem Land (collected by Sir W. Baldwin Spencer in 1912), with line drawings identifying the internal organs and external parts shown in the barramundi, crocodile, native companion, echidna, wallabies, kangaroo and a goat.

Berndt, C. H.

1962 The arts of life: an Australian aboriginal perspective, *Westerly*, **2–3**: 82–8.⁓Not read.

Gresser, P. J.

1962 New distributional records of stone implements in New South Wales and Queensland, *Mankind*, **5**: 522–33.⁓Describes camp sites in this region and the types of country in which they occur, with general observations on implements and their uses.

Davies, E. M.

1962 Cape Nelson—its camp and cave, *Vict. Nat.* **79**: 23–6.⁓Mentions an old midden site on Cape Nelson, now obliterated, and illustrates a hammerstone, axes and axe sharpening stone from Cape Schanck.

Kabo, B. P.

1957 A. L. Yschenko and his trip to Australia, *Academy of Science, Soviet Ethnography*, **6**: 59–61.

1961 Collection from Groot Island (North Australia), *Collected Essays from the Museum of Anthropology and Ethnography*, **20**: 154–172.

Kennedy, K.

1962 The crab's eye seed, *Aust. Mus. Mag.* **14**: 68.⁓A bright red and black seed commonly used for decoration by the aborigines.

Lommel, A.

1961 Stilische Vergleiche an Australien Felsbildern, *Verof. Mus. f. Volk.* (Leipzig), **11**: 19.

A discussion of the distributions of the anthropomorphs (in northern and southeastern Australia) and of the linear figures (in central and southwestern Australia), with map.

1962 *Motiv und Variation in der Kunst des Zirkumpazifische Raumes.* Staatliches Museum für Volkerkunde, München. 109 pp.

A handsomely produced study of the similarities and variations of the X-ray art style, and of the spiral and hocker in circum-Pacific countries. Elaborately illustrated, with an excellent series of distribution maps.

McBryde, Isabel

1962 Archæological field survey work in northern New South Wales, *O*, **33**: 12–17.

The survey is aimed at recording all archæological relics *in situ* including cave paintings, rock engravings, stone arrangements, carved trees, axe grooves, and midden deposits. Work has been concentrated on excavations in the Clarence river valley and the northern Tableland as contrasting areas east and west of the Great Dividing Range. Tally grooves and crown-like markings, stencils and silhouettes in Clarence valley, naturalistic motifs on Tableland. Seelands rock shelter excavation has yielded microlithic lunate scrapers and points, with bone artifacts, in top levels with a date of 1040 ± 80 B.C., and below this a single ground edge axe. Bondi points came from the lower levels. Other sites excavated at Chambigne and Jacky's Creek.

McCarthy, F. D.

1962*a* The rock engravings of Port Hedland, North-western Australia, *Pap. Kroeber Anthrop. Soc.* **26**: 1–73.

Describes sites and environment, historical background of white contact with Kariera tribe in the area, and summarizes the economic life and technology of the local tribes. A total of eight miles of rock engravings, in four localities, decorate sandy limestone ridges. The author reproduces a scale chart of a 120-foot strip, all of the groupings distinguished, and the full variety of each separate motif. Three techniques of engraving were employed—abrading, conjoined puncture and abrading. Superimpositions revealed three phases of engraving, the outline developing into figures with interior line designs, followed by the linear designs with a wide range of motifs, and the pecked intaglios poorly represented. A human spirit figure, the Minjiburu, was important from outline to pecked phases. Hunting compositions were found to be important in the linear design phase. Frequencies of motifs, artistic styles, function, antiquity and conservation also dealt with, and a comparison made between the motifs in the engravings and on wooden objects.

1962*b* Current research in Pacific Islands archæology. A. Report on Australia and Melanesia, *AP*, **5**: 141–155, 1 plate.

Summarizes the excavations completed and prehistoric cultures established in Australia, and proposes the name Tula Culture for the lower Murray sequence at Tartanga and Devon Downs; describes the superimpositions revealed in rock paintings and engravings; Indonesian pottery; lists radio-carbon dates established; discusses a preliminary historical reconstruction of Australian prehistory and the main problems needing attention; outlines the paucity of work done in Melanesia; suggests that consideration be given to a comprehensive system of classification of Oceanian stone implements to incorporate the Melanesian and Polynesian systems, and that a special study of Melanesian pottery and its prehistory be made.

1962*c* Aboriginal relics *in situ*, *Rept. Aust. Acad. Sci. N.S.W. Nat. Parks Sub-Comm.*, App. B, 131–9.

A summary of the types and range of relics *in situ*, the literature about them,the sites reserved, and a discussion of the problem of their conservation.

1962*d* Some comments on the progress of archæology in Australia, *Mankind*, **5**: 479–84.

The author's main point is to protest, on ethical grounds, against the uninvited intrusion of another archæologist, who excavated the Noola site, in an area where he had been carrying out an archæological survey for two years. He rejects Tindale's terms of Mudukian and Tartangan for the two Noola culture phases in favour of Bondaian and Capertian, proposes the name Tula culture for the Devon Downs and Tartangan sequence on the lower Murray river; he suggests that the Hood's Drift, Cape Martin and other site industries in South Australia belong to the Gambieran and not to the Tartangan culture.

1962*e* Regional reports: Australia, *AP*, **5**: 98–104.

A review of field work, literature, conferences and other aspects of Australian archæology and ethnography for the latter half of 1961, with a list (and abstracts) of the papers published during this period.

1962*f* Cave paintings of Chasm Islands in *Drawings* (pp. 19–20) by Wm. Westall. Edited by T. M. Perry and D. W. Simpson, Royal Commonwealth Society, London.

Note on the significance and motifs of the cave paintings on Groote Eylandt, and on the importance of the original recordings made by Westall in 1801–2.

1962*g* Aboriginal relics of the Hawkesbury Sandstone, *The Natural History of Sydney*, Aust. Mus. Hdbk, 23–7.

A brief description of the rock engravings, cave paintings, stone arrangements, axe grooves, trees with foot grips, shell and ashy-soil middens, protection and conservation of the relics *in situ*.

1962*h* The Australian aborigines and their art, *The Bridge*, **5**: 40–8.

A description of the economic life of the aborigines, and of the many forms of their art, with particular reference to the bark paintings.

McCarthy, F. D. and Macintosh, N. W. G.

1962 The archæology of Mootwingee, Western New South Wales, *Rec. Aust. Mus.*, **25**: 249–98.

The authors give an account of the history, aboriginal population and their economic life, and the topography of the area. They analyse in detail the range of motifs in the rock engravings, among which linear designs are in the minority and pecked intaglios in the great majority; they point out that the major subjects illustrated are hunting emus and kangaroos, fighting, and ritual scenes. Specific subjects were found to be limited to one rock surface in some instances. Human figures are associated with dingoes in one series of compositions. Information from an old full-blood aboriginal, George Dutton, links the site with the Eaglehawk and Crow myth, and with rain making, and suggests that it has not been in use for two hundred years or more. The stencils and silhouettes painted in 23 caves are analysed; relationships of paintings and engravings discussed; a series of stone mound described; and implements, of Tula culture facies, from two excavated deposits described.

MARLOW, B. J.

1962 Dingoes, *Aust. Mus. Mag.* **14:** 61–3.

The author describes the habits and characteristics of the dingo and thinks that it was brought into Australia by the aborigines and that its most probable ancestor is the plains wolf of India. He also deals with its biology, distribution and control methods.

MASSOLA, A.

1962*a* Central Victorian aboriginal weapons, *Aust. Mus. Mag.* **14:** 47–50.

The description is based on a set of models of the weapons of the Taungurong tribe in the Goulburn river valley.

1962*b* The grinding rocks at Gellibrand, *Vict. Nat.* **79:** 66–9.

Two rock surfaces bearing axe grooves are described, and also an engraving of a kangaroo track which is the first record of a rock engraving in Victoria.

1962*c* The Nargun's cave at Lake Tyers, Victoria, *Vict. Nat.* **79:** 128–32.

Describes a hole, 6 ft. wide and 5 ft. deep, on the eastern side of Nowa Nowa Arm of Lake Tyers; it is said to lead to a tunnel, the abode of spirits called Baginis, Dulagars (women who entice men), and Narguns (half human and half animal).

1962*d* The native fish traps at Toolondo, in the Wimmera, *Vict. Nat.* **79:** 162–6.

The surviving portion of the fish (eels mainly) trap channel over 1000 yards long, 12 ft. wide and 2½ ft. deep, connecting two swamps. Channel traps of this kind were known previously from an 1841 description only.

1962*e* The aborigines of the Victorian High Plains, *Pr. Roy. Soc. Vict.* **75:** 319–25.

A summary of the life and culture of the Yaitmathang tribe, taken from original sources; it includes the social life, initiation, camp life and food, material culture, sickness and death, and cave paintings.

1962*f* A grooved axe with iron haft, *Mankind*, **5:** 463–5.

A *Pur-rut-thri* type axe, grooved with mortar depression, with an iron handle found on Portland beach in 1887, is described and the uses of this type of axe are discussed. The use is queried of diminutive sandstone and indurated mudstone implements from the Darling river, with cutting edge and hammered butt, as *Kodja* tools.

MITCHELL, S. R.

1962*a* Some ethnological notes, *Vict. Nat.* **78:** 361–3.

Describes an elongated oblong of stones at Beswick, Northern Territory; a biconical stone from the Adelaide River, N.T.; a canoe anchor stone from Clybucca creek, N.S.W.; two biface spear points mounted butt to butt in gum from the Kimberleys; a small ground edge axe of limestone from Bream creek, Victoria; and a hoard of scraping tools from Wilcannia, N.S.W.

1962*b* Analysis of some Australian aboriginal surface sites, *Mankind*, **5:** 466–70.

Tables of implement types collected on 14 camp sites in Victoria, 5 in South Australia and 6 in New South Wales. He claims that geometrical microliths derive their shape from use as scrapers hafted on a handle.

MOUNTFORD, C. P. and EDWARDS, R.

1962 Aboriginal rock engravings of extinct creatures in South Australia, *M*, **62:** 174.

The authors describe three figures (crocodile head, fish and turtle) at Panarammittee North with which, they claim, the aborigines could only have become acquainted when the sea coast was much closer to the area than it is today. They discuss evidence which indicates that the rock engravings are ancient in South Australia, and support Basedow's claim that man and the Diprotodon lived in the Flinders Ranges in the same period, and also at Menindee in N. S. Wales. As no engravings of dingo tracks have been found by the authors, they claim that the dingo reached Australia after the pecked engravings were done.

PILLING, A. R.

1962 *Aborigine Culture History: A Survey of Publications 1954–57*. Detroit.

The main points of each paper, book, newspaper and magazine article mentioning the natives, and their culture, of Australia. Torres Strait islands, Papua and Australian New Guinea, are summarized under the headings of ethnology, linguistics, archæology, physical anthropology, non-human fauna and history. The second main section is a catalogue of the literature for the period, followed by a glossary of technical terms, and an index.

Plomley, N. J. B.

1961 Tasmanian aboriginal material in collections in Europe, *JRAI*, **91**: 221–7.

The author lists the collections of morphological material, portraits, stone implements, material culture, and relics of the dead in the collections; examines their documentation and archive value; and lists the institutions where they may be examined.

1962 A list of Tasmanian aboriginal material in collections in Europe, *Rec. Q. Vic. Mus.*, NS, **15**: 1–18.—A slightly fuller account of the subject than that given in his 1961 paper.

Reid, Q. W.

1962 Further discoveries of aboriginal rock carvings in Tasmania, *Pap. Pr. Roy. Soc. Tasm.* 96m 87–9.

The markings vary from scratches to grooves 3 in. wide, and from slight depressions to 2 in. deep, and consist of indeterminate straight and curved markings similar to those at the Blue Tiers. Two sites are described, at Remarkable Cave and near the Broad river.

Rose, F.

1961 The Indonesians and the genesis of the Groote Eylandt Society, Northern Australia, *Verof. Mus. f. Volk. Leipzig*, **11**: 524–30.

Groote Eylandt was occupied by the Nungubuyu tribe, who had previously visited it intermittently, about 200 years ago when the Indonesians introduced the dugout canoe. The population of the island, which has limited animal resources, was not more than 350 with a density of 2 to 2½ per square mile.

Sim, I. M.

1962 Records of the rock engravings of the Sydney District, Nos. 103–110, *Mankind*, **5**: 485–90.

Describes groups at Woronora, Darke's Forest, Waterfall, Wattamolla, National Park and Lucas Heights. Several groups of men, and a group of mythical animals, are unusual for this area.

Tindale, N. B.

1962 The progress of archæology in Australia: a rejoinder, *Mankind*, **5**: 540–44.

A reply to McCarthy's paper of the same title, concerning the excavation of the Noola site and the naming of the two cultures revealed.

Reviews

Burkitt, M. C.: Rock shelter art in North Western Australia, *Nature* 1962, **193**(4812): 221.—Note on F. D. McCarthy's paper, Rock Engravings of Depuch Island in *Rec. Aust. Mus.*, 1961, **25**: 121–4.

Digby, A.: *Records of the American-Australian Scientific Expedition to Arnhem Land*, 1948, 2, 1960, reviewed in *M*, 1962, **62**: 285.

The reviewer stresses the importance of the Nutrition Unit's report, and of the papers on Food by Miss McArthur, and on the Food Quest by McCarthy and McArthur. In the two latter papers, he said, the method points the way to future studies which will link technological and social studies and give added meaning to both; they are both, he continued, particularly important from the point of view of applied anthropology, and of great theoretical importance.

Elkin, A. P.: *Captain Cook's Journal*, Vol. II: a review, *O*, **32**: 191–7.

The re-issue of these important journals was edited by Professor J. C. Beaglehole. The review is an appraisal of Cook's contact with various native peoples and his descriptions of their customs.

Kooijman, S.: *Die Kunst des funften Erdteils Australien. Munchen* (1962), reviewed in *M*, 1962, **62**: 193.

The reviewer compliments the author or his very useful source of reference information on aboriginal art, and his excellent illustrations, among which the beautiful reproductions of designs by Mrs Lommel are notable. After summarizing the scope of the book, Dr Kooijman takes issue with the author on the *Kulturhistorische* approach, more particularly on his claims that the 'elegent' style of depicting human figures followed the diffusion route of the boomerang and spear thrower from Europe to Australia.

Birdsell, J. B.: *Records of the American-Australian Scientific Expedition to Arnhem Land*, 1948, 2, 1960, reviewed in *AA*, **64**: 410–12.

The reviewer emphasizes the importance of the Nutrition Unit's report on the present mission diet, and the health, of the natives. He considers the paper by Miss McArthur on the Food of the bush and coastal natives to be a classic in its field, and likewise, the paper by McCarthy and McArthur on the Economic Life to be a highly original contribution to our understanding of the time uses and demands upon hunting and collecting peoples. Papers by McCarthy on cave paintings and archæology are summarized, and the same author's paper on string figures is regarded as a study that will put an end to the use of string figures in diffusionist studies.

Topical Reports

1. Trans-Pacific Contacts

GORDON F. EKHOLM

The rather complete skepticism among Americanists, of only a few years ago, is now giving way to a real and growing interest in the various problems involved in trans-Pacific contacts. From work in progress known to this reviewer and the interest noted at Americanist congresses and among students at several unversities, we may expect in future more reports on our subject and an increase in their size.

American archæologists, in the United States at least, still hold that the reality of trans-Pacific contacts has to be proved in more concrete terms than has yet been done before it can be taken seriously. Absolute proof may not suddenly appear; a shift from the traditional idea of New World independence will come as evidence is gradually accumulated. The tide will turn not only with new discoveries, but also through a revaluation of evidence already in hand and a change in our view on how long distance diffusion took place in the past.

This prediction, admittedly, may prove incorrect; however, the climate of opinion is changing in a way which will allow and encourage the varied kinds of studies which we need to test our hypothesis. We should look especially for studies of specific subjects in greater depth. For instance, certain musical instruments of Melanesia and Peru have been repeatedly found to be similar in construction and use, but the potential value of this observation awaits a fuller and detailed investigation.

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1962 Relaciones entre el Viejo y el Nuevo Mundo, una Observación Metodológica, *Cuadernos Americanos*, 21(6): 160–175. Mexico.

All attempts to prove trans-Pacific contacts by similarities in designs and art motifs are strongly criticized. It is claimed that agriculture as well as writing and the calender were well founded in the Americas long before maritime contact can be postulated, so any contact that did occur was of no significance. It is a statement by a well-known Americanist who believes in the completely autocthonous development of the American civilizations.

ESTRADA, EMILIO, MEGGERS, BETTY J. and EVANS, CLIFFORD

1962 Possible transpacific contact on the coast of Ecuador, *Science*, 135(Feb. 2): 371–372.

The Early Valdivia culture of coastal Ecuador, dated 2500 B.C., is one of the earliest occurrences of pottery in the New World. This pottery shares several features of form and decoration with pottery of the Middle and Late Jōmon period of Japan, and it is suggested that these similarities may have come about through maritime contact with Ecuador. This is an important and promising discovery.

FRASER, DOUGLAS

1962 *Primitive Art.* Doubleday and Company, New York.

To a far greater extent than other art historians of the United States, who have dealt with the art of primitive peoples and early civilizations, Fraser emphasizes historical relationships between areas. Though a general summary of the art of Africa, Oceania, and America, it contains a number of suggestions and ideas of interest to the subject of trans-Pacific contacts and influences.

HEYERDAHL, THOR

1962 Merrill's reappraisal of ethnobotanical evidence for prehistoric contact between South America and Polynesia, *Akten des 34 Internationalen Amerikanistenkongresses,* Wien, 1960: 789–795.

A discussion of Merrill's last book in which he concludes that contacts between Polynesia and the Americas must have occurred to account for the transfer of certain important food plants.

1963 Feasible ocean routes to and from the Americas in Pre-Columbian times, *American Antiquity,* **28**(4): 482–488..

An excellent discussion of the importance of ocean currents as determinants of the feasibility and direction of sea voyages in ancient times. It recalls that circle routes are often shorter than those we may plot on a flat map and that currents are important to slow moving craft. The north Pacific is the only really feasible route from the Orient to the Americas, while other routes north and south of the equator allow movements in the other direction.

JONKER, F. P.

1962 Heyerdahl's Kon-Tiki theory and its relation to ethnobotany, *Annual Report of the Smithsonian Institution,* 535–550.

A careful review by a botanist of the evidence and theories concerning the history of cultivated plants in the eastern Pacific. No new materials are presented, but it is a helpful introduction to a difficult and tricky subject.

LING SHUN-SHENG

1956 *Patu* found in Taiwan and other East Asiatic regions and its parallels in Oceania and America, *BDAA,* **71**: 82–104 (English translation).

The distinctive club form known as *patu,* which has been extensively studied as a possible link between the cultures of Oceania and the Americas, is shown to occur also in Taiwan and mainland Asia. The author thinks that this area is its home and that it spread to the north to Northwest America as well as eastward through the Pacific.

1962 Stone bark cloth beaters of South China, Southeast Asia and Central America, *BIEAS,* **13**: 195–212.

The distribution of stone beaters indicates that the bark-cloth industry probably had its origin in East and South China and eventually diffused to Africa and to Central and South America. Many data are presented in support of this hypothesis.

MARSZEWSKI, TOMASZ

1961 Remarques sur l'état des recherches concernant les contacts entre les peuples de l'Asie et de l'Amérique précolombienne, *Folia Orientalia,* 1960, **2**: 117–204. Krakow, Poland.

A general review of the problem of Asiatic influences in the New World, with extensive citation of the recent literature and discussion of the arguments pro and con.

MENGHIN, OSWALD F. A.

1962 Grundprobleme der Amerikanischen Urgeschichte, *Homo,* **13**(1–2): 81–92. Berlin-Frankfort.⁓A general discussion of research in New World culture history and the problems of Asiatic influences.

MILEWSKI, TADEUSZ

1960 Similarities between the Asiatic and American Indian languages, *International Journal of American Linguistics,* **26**(4): 265–274.

Two similarities are discussed: the first is of similarities in structural forms between the Caucasian Japhitic languages and various languages in western North America and South America. The second concerns similarities in the formation of names, and some phonetic correspondences, in Sanskrit and Aztec. Though the author does not insist that these are due to trans-Pacific contacts, they are of interest nevertheless to our subject.

NACHTIGALL, HORST VON

1960 Zur Entstehung der Amerikanischen Hochkulturen, *Peideuma,* **7**(3): 151–172.⁓The early American civilizations are considered to be linked with the megalithic complex of Eurasia.

NAUDOU, JEAN

1962 A propos d'un éventuel emprunt de l'art Maya aux arts de l'Inde Extérieure, *Akten des 34, Internationalen Amerikanistenkongresses,* Wien, 1960: 340–347.

The lotus panels from Chichen Itza, Yucatan, are compared in some detail with those of India and Southeast Asia. The complex of various elements that occurs in both places is considered to be proof of relationship although the exact place or origin in Asia is uncertain.

OBAYASHI TARYŌ

1960 On the origin of the *Inau* cult-sticks of the Ainu, The Japanese Journal of Ethnology, *Minzokugaku-Kenkyu*, 24(4): 1–30. (In Japanese with English Summary)

Cult sticks or poles, which are variously considered as the loci of gods or as mediators with the supernatural, are found widely distributed in northern Eurasia and into North America. It is thought to be an old trait diffused by the ancient hunting cultures.

2. Linguistics

MILTON E. BARKER

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To the following persons who supplied information for this section, I should like to express my appreciation: Robert Austerilitz, André G. Haudricourt, Bernd Lambert, Robert B. Lane, W. J. Oates, Alan Pence, E. J. Sopa, R. W. Thompson, Elmer Wolfenden, Dean S. Worth, and S. A. Wurm.

From February to June 1962, Dr Kenneth L. Pike conducted a linguistic workshop for members of the New Guinea Branch of the Summer Institute of Linguistics. During the workshop, 22 languages were worked on, representing five different language families plus several languages of unknown affiliation. The Summer Institute of Linguistics is currently engaged in research in 21 additional languages in New Guinea as well as 38 languages in the Philippines, 11 languages in Vietnam, and 4 languages in Australia.

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1962*a* Reflexes of Proto-Malayo-Polynesian in Cham, *AL,* 4(9): 11–21.

1962*b* The 'Y' archiphoneme in Mamanwa, *AL,* 4(4): 29–30.

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n.d. *Mandarin Chinese,* Units 1–6, Washington, Center for Applied Linguistics.

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3. Human Geography

OOI JIN-BEE 黃仁美

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Notes on Research, etc. The Regional Conference of Southeast Asian Geographers which was held at the University of Malaya, Kuala Lumpur, in April 1962, was attended by more than 200 delegates from over 25 countries. The Conference, the first of its kind in this part of the world, was sponsored jointly by the International Geographical Union and the University of Malaya. It was mainly devoted to sessions on the geography of Southeast Asia, under the following sections: Biogeography, Cartography, Economic Geography, Geomorphology, Historical Geography, Land-use and Cropping, Meteorology and Climate, Population Studies, Soil Studies, Teaching of Geography, and Urban Geography. Three interdisciplinary seminars were held: one on rubber cultivation and production, another on Western theories in developing areas, and a third on Regional planning in the Humid Tropics with special reference to Malaya. A selection of the papers read at the Conference will appear in two special issues of the *Journal of Tropical Geography*, a joint publication of the University of Singapore Geography Department, and its counterpart in the University of Malaya.

R. A. French in his article, Geography and geographers in the Soviet Union, *Geog. Jrn.* (June) 1961: 159–167 outlines the place of geography and geographers in the U.S.S.R., where the most important research organization is the All-Soviet Geographical Society. This held its third post-war quinquennial congress in Kiev in February 1960; the six symposia of this congress give the main focii of interest of contemporary Soviet geographers.

The Government of Japan has approved a proposal for the preparation of a series of New National Land Base Maps of Japan, using the most up to date methods and cartographic techniques. The maps are to be drawn on two scales, 1:2,500 for urban and level areas and 1:5,000 for hilly and mountainous areas.

Much of the research work on human geography in the Far East is being done by American geographers, or geographers in American universities. The following is a short list of these geographers and their research projects: T. F. Barton is currently engaged in research on the rice industry of Thailand; D. C. Bennett on settlement forms and patterns in Southeast Asia; J. M. Blaut is writing a book on shifting agriculture in Southeast Asia; C. M. Davis on environmental elements in Southeast Asia; K. Davis on past and future urbanization in India; N. S. Ginsburg on the changing character of Asian cities; J. E. Spencer who has completed his monograph on *The Comparative Morphology of Shifting Cultivation in Southern and Eastern Asia*, is currently working on fishing and the economy of Southeast

Asia and the historical evolution of rice culture in Southeast Asia; L. P. Gosling on aspects of land use in Malaya and British Borneo; H. F. Hirt on the geography of cities in India; P. P. Karan on the Chota Nagpur Industrial District; R. C. Kingsbury on agriculture in India with special reference to plantations; D. Kornhauser on some aspects of Japanese urbanization; C. H. Macfadden is writing a book on the effects of colonization on agriculture and industrialization; P. C. Morrison on the geographical aspects of resource utilization and of settlement in Hokkaidō, Japan; R. W. Murphey on the spread of rice cultivation westwards from India and China; K. J. Pelzer on the agrarian conflict between peasant and planter in East Sumatra; W. L. Thomas on man's role in changing the face of the island of Luzon; P. Wheatley on the morphology and function of Southeast Asian towns in the pre-European period; and W. A. Withington on the regional geography of Sumatra.

New Far Eastern Geography periodicals. The first number of the *Journal of the Geographical, Geological and Archæological Society* (University of Hong Kong) appeared in March 1961. It contains several articles on the geography of Hong Kong and China. The frequency of publication is not stated.

Geographers and other research workers interested in the human geography of China may like to know that the United States Joint Publications Research Service (a governmental agency, which 'functions as a centralised, unclassified translation service for those U.S. government departments having an interest in and a need for the processing of foreign documentary materials') publishes a wide range of materials on all aspects of Chinese affairs. The literature dealing with Chinese geography may be obtained from the Office of Technical Services, Department of Commerce, Washington, 25, D.C.

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Notes and Articles

I

New Data on Palæolithic finds in Mongolia*

MIKLOS GABORI

The American expeditions led by Roy Chapman Andrews in the 1920–1930's were followed by a long interval with no new data forthcoming on the neolithic civilization of Outer Mongolia. While in the surrounding territories of Siberia and North China research kept advancing, it stagnated for twenty years in the Republic of Outer Mongolia. Recently attention is again drawn to a problem still in suspense on the earliest cultures of the Mongolian Plateau and Northern Gobi. What made the gap in our information so noticeable was that during those twenty years, important sites in North and Eastern Siberia were and are still being discovered in increasingly great numbers and, moreover, that the wealth of materials garnered by the Sven Hedin expeditions were published. But until recently the very rich collections made by the large-scale expeditions organized by the Americans remained inaccesible, and about which researchers had only N. C. Nelson's preliminary reports to go by. One reason for this, in our opinion, is that the ideas and hypotheses held about the Gobi cultures are far more numerous than the archæological materials permitted, prior to the comprehensive works of F. Bergman (1945) and F. Maringer (1950).

In the 1950's new research started. From the occasional pick-ups here and there during the archæological diggings of sites of historical periods, many stone-age sites came to notice in various parts of the country—outside the area covered by the Andrews expeditions. And now during recent years a mass of sporadic finds have been accumulating in the small collections of the capital and certain district centres. Their importance lies firstly in that they are new landmarks in the unexplored regions of Mongolia and at the same time provide incentives for more systematic excavations (Ser-Oddžav 1956; Dordžüren 1957–1958). Later two expeditions of A. P. Okladnikov brought to light finds of the greatest importance, especially in the Southern Gobi sector and Orkhon river region. In his excavations Okladnikov succeeded in securing objects of the most archaic type ever found in Mongolia; and in 1960, the first excavations of a stone-age stratum were undertaken in the Orkhon river region (Okladnikov 1962). In 1958 and 1961 I myself made excavations in different parts of the country, particularly in Central Gobi and the Gobi-Altai region (Gabori 1962*a*, *b*). During our expeditions we explored in part sites located by the Mongolian Museum staff, we made new excavations there and examined new areas. At the same time with the aid of Mongolian scientific organizations we were able to study in more careful manner all the archæological material preserved in the country's collections, and later publish our findings (Gabori 1962*a*). The new data have greatly modified our views of the Stone Age of Mongolia. We can now take into account some sixty new sites (Gabori 1963*b*);

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* Translated by Barbara Pforr Merbs from the French original text.

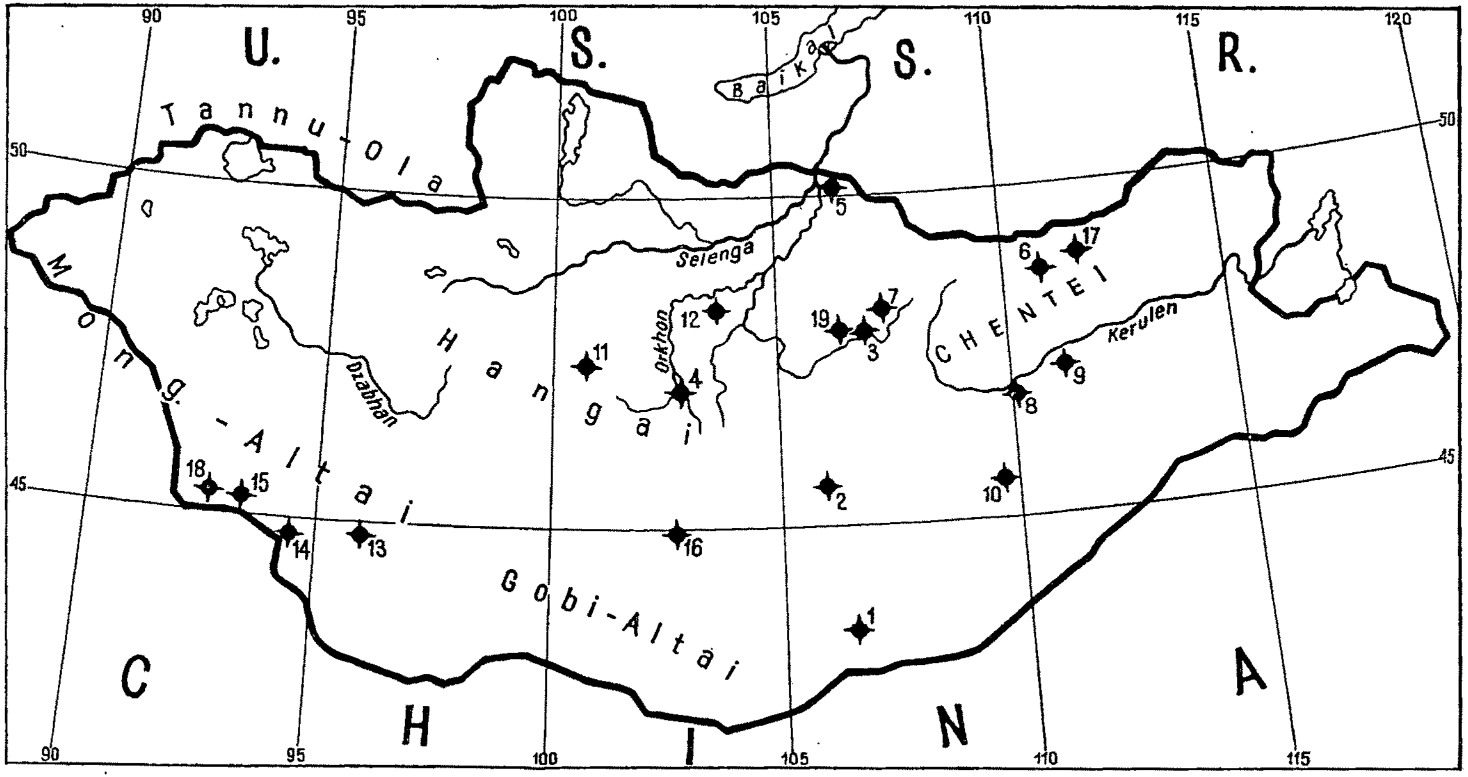

FIG. 1. Sites of Palæolithic finds in Outer Mongolia.

1. Ottson-maïnt
2. Mandal-gobi
3. Tseisan-tologoï (Oulan-bator)
4. Erdene-dzu
5. Altan-bulag
6. Binder, Rashan khad
7. Makhūr tolgoï
8. Kherē gökhöl
9. Bayantsogt ovō
10. Ulān-dzēg
11. Taïger-tšulū
12. Inget tolgoï
13. Narīn tūroï
14. Tsagān ders
15. Damdžigīn us
16. Bodgo-solongo
17. Öglögtšin kherem
18. Övdög tünkh
19. Oulan-bator, airport

some of which indicate the beginning of civilization in this region at a period much earlier than we had so far thought.

From the typological point of view, the most ancient culture of Mongolia can be defined as Levallois-Mousterian. It was A. P. Okladnikov who discovered the characteristic material in the region of Ottson-maïnt, located in the southern Gobi close to the Chinese border. The lithic industry gathered in several places includes a range of relatively primitive macrolithic blades, traces of which have also been picked up elsewhere. The tool assemblage is composed, for the most part, of large crude blades, but objects of Mousterian type as well and cores of an archaic type which attract attention (Okladnikov 1962: 86). Most of the objects are roughed out [épannelés] and sometimes superficially worked, in a fashion similar to those known in the cruder flake industries. Nevertheless the different types are clearly defined. The archæological material contains sporadically some narrower blades, in part retouched, while the kinds of tools of more recent cultures known from other excavations are absent. The ventral side of the tools is smooth, exhibiting a marked bulb of percussion. The most characteristic trait of the Ottson-maïnt lithic industry is the Levelloisian technique—the form given to the base—large and blunt sections of the base remain on the blades and this confirms their typological classification.

N. C. Nelson had mentioned earlier the sporadic occurrence of tools of Aurignacian and Mousterian types in the southern region of the country, especially on the plateau situated between Ulān-nūr and Arza-bogd mountain, as well as near Orok-nūr (Nelson 1926: 11–12; 1939: 260). F. Bergman, who published similar data from Inner Mongolia, says that among the objects collected some might be earlier than Neolithic; but they appear to represent rather typological traditions (Bergman 1945: 191; Maringer 1950: 206). So far we have no coherent group of important Palæolithic finds to formulate definite identifications. What we particularly need are stratigraphic observations, which likewise we lack for Ottsonmaïnt.

For surface finds only the typological definition of the tools can be made. Besides type and shaping, the objects possess external characteristics, which clearly distinguish them as a group from the objects of industries so far known, and in particular by their material, dark grey and occasionally reddish colour, patina and wear which characterize tools found in the deserts. Their cutting edges, their retouches, and their entire surface are well worn, as though eroded by sand, something not observed in the Mesolithic and Neolithic finds in similar conditions, not even of tools of the Late Palæolithic. For analogies of typological classification, we need only go to the forms of the classic Lower Palæolithic of Western Europe, among which are a number of tools of the same type.

Though the archæological material from Ottson-maïnt has not been published in detail, one already sees its importance. From the Mesolithic onward (the archaic phase of the Shabarakh culture) we know something about the peopling of the Gobi, and with this sudden appearance of an industry, apparently connected with the Lower Palæolithic, several new observations on the whole industries of Inner Asia may be made. According to A. P. Okladnikov the appearance of Levalloisian techniques is proof that the Gobi well might have had worldwide importance in the gradual advance of civilization. Finds which he estimates as dating from 40 to 50 thousand years or even earlier, he defines as Palæolithic in the true sense of the word (Okladnikov 1962: 86). What is important is the fact that the recent cultures of the Gobi had local antecedents in this region, which were carried over through the intermediary of definite cultural diffusions.

From Central Gobi, near Mandal-gobi we know of a find which though consisting of only a few tools, bears great resemblance to the Ottson-maïnt tools. There too the utensils were surface finds on a desert or semi-desert type of terrain: blades of large size and crude treatment, a point worked like the Moustern type besides other less typical tools—their material and patina are identical to those described by Okladnikov. It should be mentioned that in the same restricted territory, the predominant industry is late Mesolithic, represented by small-size tools (also surface finds), with neither the patina or characteristic wear of the first (Gabori 1963*b*). Their difference is not to be explained by the different properties of the rock that was used; they are older tools of the Levalloisian type, made of more massive and harder rock formed by the silification of sedimentary clay (group of spilocite-desmocite rock). Unquestionably we are confronted with finds of two different cultures—though lacking more concrete data on their chronological relationship. Several similar atypical tools are also found to the north, in the vicinity of the settled area of Delgertsogt (in the district of Central Gobi); but the majority of the tools recovered there belong to the Mesolithic.

Tools of Lower Palæolithic type, although in a reduced number, are found near Ulan-bator at Tseisan-tolgoi on the Tola terrace. A. P. Okladnikov mentions rich materials of the Late Palæolithic discovered there (Okladnikov 1962: 88), but among the earliest tools are several Mousterioid pieces, clearly earlier from a typological point of view (Dordzüren 1957: 5; Gabori 1963*b*). Possibly it is a problem of two industries of different character—or else chronologically, very late tools, but connected by their type to the Lower Palæolithic. Analogous phenomena are noticeable in the region north of Mongolia. Mousterioid types appear after the complex of Mal'ta-Buret', due to a southeast influence. Here, the rock material of the tools differs from that used in the desert region, but is similar to that of the Late Palæolithic and Epipalæolithic objects showing strong Siberian affinities, discovered at other sites in this Tola sector.

From a typological point of view, the material that A. P. Okladnikov found in an archæological stratum, not far from Erdene-dzu (the ancient Karakoroum, actually Kharkhorin) on the terrace of the Orkhon, belongs to an analogous industry. The tools found at a relatively shallow depth, in the lower archæological layer, are nearest to Levalloisian and Mousterian types (scrapers; points; large, regular formed blades; split and worked stones like choppers) (Okladnikov 1962: 87–88). In the upper layer these types occurred with equal frequency, but the major part of the material belongs, from all evidence, to the Mesolithic (prismatic cores, small scrapers, core scrapers of the Siberian type). In our opinion, the lower bed culture is younger than that of Ottson-maïnt, as the truely archaic elements disappear little by little in the more recent blade culture—for even though the Mousterioid tools are similar to those of the Mousterian culture of Soviet Central Asia, Uzbekistan (Teshik-Taṣh, Amir-Temir, Khodzhikent, etc.)—this material has a characteristic appearance of the Late Palæolithic. The immediate stratigraphic succession of this Levallois-Mousterian type industry and the Mesolithic, and the relationships of their assemblages, pose a problem that will only be resolved when we have detailed publication of the finds.

The origin of the Mongolian finds, in appearance analogous to those of the Lower Palæolithic (in the main we believe, to those discovered in the Gobi), still requires more study. The Palæolithic of Central Asia mentioned above, of Northern China, and in a wider sense, of South-East Asia may affect their connections with other industries. The occurrence of several tools of Acheulian type does not necessarily indicate an indigenous development. As said previously, the finds along the banks of the Orkhon show on the whole a typological resemblance to those of Central Asia, but the different types may have come, for that matter, from the Gobi, and the choppers point neither to the North or the Northwest. In the territory of Inner Mongolia some tools are also found which, in type and other external characteristics, as well as wear, seem to be absolutely identical with the objects mentioned above (Maringer 1950: pl. XXXVII, 2). Likewise Levalloisian and Mousterian elements appear in the Palæolithic of North China (Movius 1955: 280), where, probably, we should look for the origin of their influences. In the Stone Age culture of the whole of Mongolia down to more recent periods, we find a vaster and more coherent cultural area in the region east of the Altai and on Chinese territory—but this does not exclude close Mongol-Siberian relationship, since migrations took place within the area. The question of whether this primitive blade industry is—chronologically—closer to the Late Palæolithic or to the Mesolithic than we had thought from the typology of finds, cannot be definitely settled for lack of more exact observations and some stratigraphic data.

The deposits and finds of the Palæolithic and the Epipalæolithic ages though more numerous are still insufficient to give a coherent picture based on the forms and kinds of tools. We know of approximately 15 assemblages, big and small, in different parts of the country, among which comes in first place, the rich lithic industry from an archæological layer of the Tola terrace near the Ulan-bator airport (Okladnikov 1962: 88). This material is still unpublished. The rest of the finds come from surface collections, and because of their geographical localization and their position in the direction of culture diffusion, they show certain typological differences.

The tools from beds found in the northern part of the country—at Altan-bulag on the Siberian frontier, Binder (Rashan khad), Öglögtšīn kherem in the region of the Onon river (district of Khenteï)—prove a direct relationship with the culture of southern Siberia, Altan-bulag—where at another place, a Neolithic of northern character is encountered with scrapers on blades, prismatic burins, angle burins and bec de flûte, retouched blades of average dimensions and cores, all Palæolithic in character. These tool types are known not only in the Trans-Baikal beds and other adjacent Siberian sites, but in all the immense region called 'the Eastern Europe-Siberian sphere'. Often the rock with which the tools are made is identical to that of the objects found to the southeast of Baikal (Abramova 1953: 277). We may remark in Mongolia, we come across tools of a type more archaic than the Trans-Baikal tools recently published by Okladnikov (1961: 157, fig. 2–3). Some similar objects occur in a number of beds in South Siberia, up to the Yenisei (for example the finds of Mal'ta, Afontova, Katuni, the Angara region), and it seems that the relationships of the Mongolian industries with these last are even more marked than with the material of sites geographically closer; perhaps explainable by chronological divergences. Some of the late Upper Palæolithic tools of the Siberian type also occur at Öglöktšīn kherem. This rather scanty material contains none of the rather large tools of the later period or implements of the recent Gobi culture. Among it there are different scrapers and large blades partially retouched at their base, with several atypical burins and some 'Mousterioid' types. Just as at Altanbulag some types of tools, which become frequent only later in the Mesolithic, are found.

Several tools of the same type have been found at Makhūr tolgoï to the northeast of Ulan-bator and further west, and even northward in the environs of Inget tolgoï, Kobdo, and Taïger-tšulū (district of Bulgan), and Khanngaï. At these last places, scrapers on large size blades, double scrapers and several Aurignacian types are encountered. Towards the southeast appear vestiges of this late Siberian Palæolithic culture, in the region of the Kerulen river, Kherē gökhöl and Bayantsogt ovō (district of Khenteï), and also further to the south, in the semi-desert region in the vicinity of Ulān-dzēg (district of the eastern Gobi).

The implements appear to change slightly with the distance of their sites from where such implements first appeared. The Bogdo-solongo site in the southern part of the country supplied most of the scraper blades of rather Epipalæolithic nature, whereas there is an absence of other sorts of Siberian tools, for example burins, which however are rare enough throughout the whole of Mongolian territory. The scraper blades resemble for the most part those known in the most ancient phase of the Shavarakh culture, and to their analogues found farther south in the industries of Inner Mongolia and Sinkiang.

In the southeastern part of Mongolia the south of the Altai range, some Late Palæolithic tool types in four different locations are known to us. These small collections of finds differ from those of the North. Among the implements collected at Övdög tünkh (Khovd district) are some retouched blades with greater than average sizes, and scrapers on blade ends of the Aurignacian type, and also crudely worked blades exhibiting features of the Lower Palæolithic, and Mousterian points similar to those already mentioned. Their material and patina are likewise similar to those of the objects found in the Gobi, and we cannot dismiss the idea that these types possibly reached the West by a more direct route from the central region of the Gobi. It remains to be seen whether all these finds with their varied composition represent the same cultural level although, unquestionably, among them are found the fewest Mesolithic elements. Not far from this bed, in the vicinity of Damdžigīn us, also occur several types of archaic tools (in the same region there was also clearly distinguishable Neolithic material) and the collections found more to the east, in the vicinity of Tsagān ders, and Narīn tūroï, also show traits very close to those of the preceding ones (Gobi-Altai district).

The typological character of the finds mentioned, which belong in part to the Late Palæolithic and in part to the Epipalæolithic, can be classified with the Siberian culture, probably of the same age. We know that there was a north-south cultural penetration, reaching the southern part of the Gobi, and its way led in all probability, across the Selenga-Orkhon valley. We recognize this already in the vestiges of Mousterian type tools (Tola terrace, Erdene-dzu, Khenteï region, Gobi-Altai region), and the opposite direction of this influence, probably of a southeastern origin, which perhaps made itself felt more than once during the Stone Age and became more intense in Siberia during the Neolithic. At the same time, we already trace Mesolithic types—the chronological-cultural interdependence between these and the Lower Palæolithic assemblage is a recurrent problem. That the roots of the Mongolian Mesolithic, no less than the interrelations of its industries, were developed earlier, well before the archaic phase of the Shabarakh culture, seems probable.

These types of Palæolithic tools, which because of their greater number, can be regarded as collective finds, raise several problems, and our research is now at the stage where again these questions depend even more on their cultural and chronological classifications. The new finds, particularly those coming from a vast, little explored territory, readily lead to diverse theories. We therefore consider that the definite answer to the problems awaits wide-spread excavations and publication of the materials that have been unearthed.

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Ryūkyū Report 1962

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The following report of the archæological survey of several of the Ryūkyū islands, in May and June 1962, was done under the auspices and with a grant of the Honolulu Academy of Arts, to whom I wish to express my cordial thanks for its generosity and understanding and also for bearing the cost of the plates.

Part I contains amendments and corrections to the general statement on the present archæological situation of the Ryūkyū's in 'Some aspects of Ryūkyū prehistory' by Kokubu and Kaneko (1961). Part II is a preliminary investigation for a survey of megalithic structures in the Ryūkyūs.

PART I

No new evidence has been discovered of an undisputed palæolithic site in these islands.

The suggested division of the Ryūkyūs into three culture areas appears still basically sound.

Area A: Satsunan islands 薩南諸島

Area A participated in the Kyūshū 九洲 pottery traditions from early Jōmon 繩文 onwards. The Jōmon sites are usually found in coastal shell-mounds. Occurrence of at least early and middle stages of Kyūshū Jōmon (Sobata 曾火田 Sainokami 塞ノ伸, Ichiki 市來, Ibusuki 指宿) are reported from Tanegashima 重子島 (Mitomo, Kawaguchi and Kokubu 1953: 25–44). Jōmon, in this report we shall—simplifyingly—define as a regional and temporal culture concept, applicable to Japan and affiliated areas (Satsunan islands and Chishima 千島 islands) at a certain period of prehistory when cord impression was predominantly practised in pottery manufacture. The habitual classification of Ryūkyū pottery in terms of Kyūshū Jōmon sequences is misleading, because, as yet, we have no means to determine the time lag between a Kyūshū type and its apparent Ryūkyū derivate. It must also be kept in mind that no real cord-marked ware has yet been found in the Ryūkyūs.

The strategically important Tokara 吐噶喇 islands, forming a bridge between areas A and B are an archæological *terra incognita*.

Area B: Amami 奄美 *islands, Okinawa* 冲繩 *and its offshore islands*

The tentative inclusion of this whole area into the 'Yayoi 彌生 sphere', in the sense of a southern extension of this regional and temporal concept (Kokubu and Kaneko 1961: 000) may well prove premature. Identification as late Yayoi ware of pottery found on Yoron 与論 island (Kawaguchi 1959) has not remained unchallenged.

Judging from the sherds in possession of the Shuri Government Museum, the term *Sue* 須恵器 ware should also be used with caution; its identification with Japanese Sue (Kokubu and Kaneko 1962: 95) is questionable; a relationship with Korean pottery has been suggested (Kim 1962: 8). Since a continental origin is also assumed for Sue (derivation from Silla pottery 新羅器) the relationships meant by Kim Won-yong are most probably direct ones. How these contacts were established we do not know.

The human burials in shell-mounds found at Chiabaru, Noguni, Iejima-Yashintori (Tawada 1962) have added a new and exciting interest in shell-mounds. They effectively silence the recurrent myth of a mere abandonment of the dead (misnamed 'windburial' 風葬) preceding the recent and present-day multiple disposal method (Kaneko 1961). All burials so far discovered were in interior upland shell-mounds where they are reported to occur beneath the culture-containing layer in either soil or white sand. That shell-mound and burial were contemporaneous is suggested by the funerary inventory of shell pendants and shell rings, a feature characterizing most of the interior upland shell-mounds.

Some of the interior upland shell-mounds are associated with caves which probably served as shelters of the shell-mound people. In other cases, particularly Iha 伊波, pit dwelling is strongly suggested by clearly noticeable indented areas in the terrace above the shell-mound. A careful excavation of such dwelling sites has a priority claim on our research list.

Shell-mounds featuring a predominantly maritime inventory occupy the coastal areas. They are often characterized by deposits obviously left by populous communities. Judging by the depth and extension of the deposit, some small islands, particularly in area C, appear to have supported a shell-mound population much greater than our recent population figures. Systematic horizontal and vertical excavation of these shell-mounds may give information about the dwelling pattern of the shell-mound people and what has become of them. Discrepancies in population figures and gaps in cultural traditions indicate that the recurrent theme of local tales of repeated catastrophes wiping out whole populations, may be based on ascertainable fact.

Area B prehistorical usage divides the shell-mounds into an 'earlier' and a 'later shell-mound culture'. Leaving aside the inapplicability of the term 'culture' in this connection, distinction can be made on the basis of

i. their topographical position (interior upland terraces and coastal lowlands);

ii. their size (upland shell-mounds tend to be smaller in extension and have shallow deposits);

iii. their inventory. *Upland:* bone and shell ornaments, rare finds of arrow points, stone implements are predominantly axes, the prevalent pottery form is a large-mouthed, flat-bottomed jar, decoration with geometric designs incised parallel to the rim, the pastes are brittle and heavily tempered with quartz and sand. *Coastal:* bone and shell ornaments show a sharp decrease and disappear from later strata, stone implements show a greater typological variety, but axes decrease in frequency, pottery with pointed base is sometimes found, but most vessels are plain, or designs limited to curved chevrons.

A medium date for the earlier shell-mound period is suggested by Chinese coins of the Ch'in 秦 dynasty (221–206 B.C.) found in the Gusukudake 城岳 shell-mound. Yawata Ichirō (1950: 31–38) thinks that the shell-mound antedates the 3rd century B.C., because the associated pottery appears to be relatively late. Recently this pottery has, on the contrary, been termed as early (Takamiya 1961:5), but since the site has been completely destroyed by quarrying (a fate threatening most upland shell-mounds) that the site may be later than assumed cannot be substantiated.

An approximate date for the later phase is the find of Chinese coins of a period between A.D. 621 and 950 near the bottom of Noguni 野國 shell-mound (Bird and Eckholm 1959). In Tawada Shinjun's (1956: 40) relative chronology of Ryūkyūan shell-mounds, Noguni figures as 'early' 前期. This shell-mound has also been completely destroyed. Judging by these finds and on the yet unproven assumption that the coins deposited in the shell-mounds were not considerably later than their mintage, we have a span of 1,000 years between the early and late shell-mound periods.

Area C: Miyāko 宮古 *and Yaeyama* 八重山 *island groups*

Very little is known about the prehistoric position of the Miyāko group, where to the best of my knowledge, no excavation of professional standard has yet been done.

All archæological and ethnological research in the Ryūkyūs is retarded by a peculiar 'Anschluss-ideology', that the Ryūkyūs are but a pale reflection of the greater glory of Japan, and thus implies that everything Ryūkyūan must necessarily have a Japanese source. But the wholesale adoption of Japanese archæological terminology and chronology is quite inapplicable in our area C. Recurrent reports about discoveries of allegedly palæolithic sites in these islands must be understood as a misapplication of the Japanese term 'mudōki bunka' 無土器文化 = non-ceramic culture. In Japan these non-ceramic phases happen to be also preceramic and Ryūkyū archæology produces the peculiar equation: non-ceramic = preceramic = palæolithic! This quite apart from the fact that to date all sites so designated have proved to be late.

Pottery and stone implements seen in Miyakoan collections would justify the inclusion of the Miyako group into area C and support G. H. Kerr's 'island stepping stone theory' of an original settlement from the south (Kerr 1958: 23). But future excavations, and even the available surface finds may well in the future establish the Miyakos as a separate area. Moreover, the absence of reliable stratigraphic accounts from the Miyako islands forbids any comment about the absolute, or even relative chronological position of the artifacts and reduces them to mere circumstantial evidence. The stone implements are typologically early neolithic (Kokubu and Kaneko 1962: 108) and their upper time limit may in Miyako coincide with the big megalithic tombs of the late 15th and early 16th centuries, where they are reported amongst the funerary inventory. The associated pottery will be taken up in a later context.

At the present state of our knowledge we can broadly distinguish:

i. A prehistorical southern component of local Miyako culture, represented by pottery and stone implements of uncertain starting period, but shared with the island group to the south. Furthermore, local traditions attributes the introduction of most important crafts to the south and pre-work rituals are always conducted facing this direction.

ii. A historical northern component brought about by contact with and inclusion into the realm of Chūzan 中山 A.D. 1522. It must be emphasized that written records and with them the beginning of historical times are in our area late mediaeval and the transition from prehistorical times is an elusive process.

iii. A variety of culture elements cannot be directly assigned to either south or north. It may, in this connection, prove rewarding to consider seriously local traditions about frequent and direct intercourse with China. Local tradition is borne out by Chinese sources recording the arrival of fourteen Miyakoans on the Chekiang coast in A.D. 1317 (Akiyama 1930). The tradition about the two T'ang 唐 (period) brothers who are worshipped as culture bringers in a special little shrine near their landing place at Matsubaru, Hisamatsu 松原, 久松 is a further instance. However we should note that in this area, the Chinese are generally called the T'ang people *to-jin* 唐人.

A study of relationships between castle sites and nearby burial caves proved impractical as planned. In the absence of aerial surveys, or even large scale maps, castle site studies are stifled in the abundant vegetation of these parts.

One big burial cave at the back of Uipiyayama 上北屋山 castle was surveyed. The original ground plan of the castle is hidden under impenetrable bush and I do not know whether the cave was within the castle confines. Chronologically castle site and cave are not incompatible, whether the local contention that Uipiyayama was a pirate stronghold (desperados from the whole Far East led by a core of Japanese [Inamura 1957]) proves correct or not. The funerary pottery seen *in situ* and in the houses of people known to have looted there is of the same ordinary ware serving in this function without substantial changes for several centuries. Within this general and temporal context castle and cave are compatible, although the cave appears to be younger in respect to its present occupancy. The time-depth of occupation will have to be determined by a trial trench. At present not a sherd of the outlandish ware, which one may have expected, graced the resting place of persons of social distinction (be it local feudal lords or foreign pirate) is found. The skeletons strewn in profusion all over the available floor of the cave show, together with pottery, a most disconcerting tendency of disappearing from day-to-day.

Although this project is a key to castle site research, the reply is uncomplete and inconclusive—only to a team of workers it would present no special difficulties.

The coastal strip between the abandoned Arazato 新里 village and Futanii calls for attention. It is characterized by a considerable number of dwelling sites and stone walls. There are also quadrangular stone platforms (representative measurements: length and breadth 2 m., height 1·50 m.) in dry masonry technique made from rough coral blocks and coral block tumuli, making use of natural rocks as lean to, wherever available. The human remains found on top of the platforms suggest they were used as exposure platforms. In all cases I saw, the remains consisted of weather beaten and inarticulated bones of a single skeleton. Nowhere have I found a skull or funerary objects. We may therefore, assume that exposure of the body on the platform was followed by a second phase, with the gathering of the bones, particular bones, or, at least, the skulls and depositing them somewhere else. In short, the disposal method represented by these impressive platforms is a variant of the ordinary multiple disposal form of the dead as practised all over the Ryūkyūs. It is possible that the purified bones were placed in an urn, over which a tumulus (round ground-plan) was built. Since the Ryūkyū Cultural Property Protection Committee has never given as yet an outright excavation permit, confining foreign archæologists to 'surface collection and surveys', this and many other questions have to be deferred to a later date.

However, during the few hours of my visit to this area, several tumuli and platforms were completely destroyed by stone crushers who operate nearby a small brick-making plant. An appeal to local authorities for preservation of at least a representative number of these structures was turned down on political and economic grounds.

A small shell-mound near a cave in Karimata and the whole area of Bora Furujima 保良古島 are reported to be of considerable interest. They were surveyed by my colleague Kim Won-yong of Seoul National University, and I have no first hand knowledge of them.

The pottery of area C is characterized by *panari* pottery, defined as very coarse, low-fired, red-brown with tempering of sand and crushed shells. Prevalent forms are globular vessels with narrow necks and characteristic, horizontally placed lugs (外耳土器). Shell-mounds, abandoned village sites, caves and other resting places of the dead abound with panari. Today prehistoric and historic panari remain virtually undistinguishable, but for the context in which it is found. The name *panari* is taken from the local appellation of the two small Aragusuku 新城 islands, which seem to have been the centre of local pottery making to the beginning of the Meiji era (A.D. 1867–1912). Panari is supposed to be in Yaeyama dialect Japanese *hanare (jima)* 離島 (isolated, or faraway island). The earliest written source to mention this ware is an account of the Korean castaways swept to Yonaguni 与那國 in A.D. 1479 (Seung Chong 成宗 1499). According to the Koreans panari was the only pottery known in the Yonaguni of their times. Whereas earlier horizons in Yonaguni contain only panari, Chinese porcelain, mainly celadon, is found mixed up with panari in all post-A.D. 1520 sites. The year A.D. 1520 is the year Yonaguni was overcome and subsequently included in the realm of Chūzan 中山.

Although Yonaguni (for which we have inferred dates) is only marginal to the group, the same successive layers, prehistoric panari, followed by historic panari (utility ware) plus Chinese porcelain (ritual and prestige use) appear in the whole area. According to G. H. Kerr (private communication 24–7–1963) trade ware of Southern Sung 南宋 (1127–1279), Yüan 元 (1279–1368) and earliest Ming 明 (1368–1644) was identified during his last 1962 survey trip to area C and considerably exceeds our previously assumed earliest dates for trade ware (Kokubu and Kaneko 1962: 112). Indeed, it seems now that (quite contrary to the commonly accepted sequence of events that intensified intercourse with Chūzan and its *Anschlus* by Chūzan introduced celadons and other Chinese porcelain into area C), this incorporation may have rather cut off a flourishing direct trade, as suggested by G. H. Kerr (private communication, as above). This reversal does not, of course, alter the actual find situation, although it would considerably increase the antiquity of the prehistoric layers containing only panari. Panari and stone implements obviously remained the principal utensils, even after the introduction of celadon and iron. I should like to except Yonaguni from this direct trade relationship, because the Koreans clearly state that both porcelains and pigs are unknown on this island, while they were seen on all other islands. Their report is fully borne out by our 1960 trial trenches on Yonaguni. As to the reason for this virtual isolation of Yonaguni we can only speculate. Not adverse navigational conditions, I think, but the bad reputation which the islanders had amongst neighbouring islands (repeated references to cannibalism) may have discouraged intercourse with this rather remote island. However, the presence or an absence of celadon is our only criterium for applying a division in the prehistory of this area. A generally accepted relative chronology of sand tempering preceding shell tempering may not be very reliable, since on Shimoji, Aragusuku 下地新成 I found a clay site, where clay is naturally mixed up with crushed shell particles. Further research will have to say whether all shell tempered panari comes from Shimoji and where sand tempered panari comes from. In view of the universality of panari all over area C extending into area B at Yabuchi 藪地 (Kokubu and Kaneko 1962: 117) as well as appearing as import ware in the castle sites of Okinawa, it may be doubted that the two tiny islands, associated with it in recent times, are its original dispersal centre. Close attention should be paid to Formosan parallels and to the prehistoric pottery of identical character and form observed in coastal Southeast China by Professor Esaka Teruya of Keiō University, Tōkyō (personal information). Conclusive evidence as to the direction and date of entry of this pottery in our area will be a major break-through in Southern Ryūkyū archæology.

Although pottery making was discontinued almost a century ago, its technical process is recalled in a traditional potters' song sometimes still heard from old people. The technical details are strikingly reminiscent of Philippine pottery making described by Solheim (Solheim 1952).

Significant new stone implement finds from this area include a semilunar perforated stone knife (slate) and associated shouldered adze. As both implements were mislaid, identification is on the basis of sketches drawn independently by three different informants. Stone knives, the characteristic implements of most rice growing cultures are not completely lacking in the Ryūkyūs, as had been thought. The Shuri Government Museum possesses a number of specimens, amongst them a beautifully finished miniature one. I located two further stone implements with indentations on all sides (clam or fruit kernel cracking) in Yonaguni. One was found in a post-A.D. 1520 context which does not, of course, exclude the possibility of their greater antiquity in general.

Part II

Following Heine-Geldern (1959), I define megalithic monuments as materializations of a particular world-view centred on the concept of permanence as realized in the eternal link between past, present and future generations. This world view is also characterized by a certain eschatology, salvation ideas and ancestor cult. Megalithic monuments are therefore neither limited to structures built of huge stones, as implied by the name, nor are such structures necessarily megalithic monuments—all depends on the spiritual context of the structure.

Notwithstanding these megalithic concepts and materializations, identical cultures are not to be expected in all distributional areas of the megalithic movement, since it is known to have entered into symbiosis with diverse religions and to have gained hold on various types of social structures. However, the concepts and their material expressions show such uniformity as to warrant the assumption of a common origin. Transcending time and continents, the megalithic problem calls for co-operation between archæologists and ethnologists, living megalithic cultures supplying many clues for the interpretation of prehistoric megaliths.

Shifts of emphasis or variations in scope can be accounted for by the type of culture locally encountered by the megalithic movement. Megalithic structures most frequently found may be summarized as follow.

i. Monuments

Monuments erected to the memory of a dead or living person (need not be a cenotaph, but a bridge, stone-seat, etc.). They not only increase his prestige, and social rank, but give also his name permanency and/or ensure propitious conditions in the Beyond. The erection of a monument is the occasion of a lavish feast, or even a series of feasts (feast of merit or mortuary feast) which only the wealthy can afford. It often demands the concerted efforts of the whole community and brings about a redistribution of wealth. Its fertility powers for crops, animals and man, are not limited to the owner, but extend to the whole community. Some of these structures have a magic apotropaic power.

Menhirs frequently found in this area, in majority act as magic barriers and are accordingly erected at crossroads, or at the foot of a garden wall, wherever it faces the public road (Pl. V*c*). Their apotropaic power is sometimes increased by incising three characters 石敢當 (*sekkanto*, i.e. 'stone, can, withstand'). The characters are sometimes cut directly in the garden wall and substitute for the menhir. The distribution area of the magic obstacles includes China, many parts of continental Southeast Asia, the Ryūkyūs, Kyūshū and southern Honshū of Japan. In some instances the whole 'spirit wall', an inner wall which covers the front opening in the garden wall and shields the inhabitants from view as well as from evil influences, consists of menhirs (Pl. V*d*).

Menhirs as memorials for individual dead were formerly in use, but to establish the identity of persons thus honoured, or the circumstances of erection, is difficult in all those cases, where the memorial is not connected with the tomb.

Menhirs and memorial dolmens used as prayer stones and altars within a sacred compound will be taken up in a later context; but prayer stones and altars are also found outside of these compounds. Two such instances are the rain-prayer stone in Sonai, Yonaguni 祖納 and the ancestral altar of the Tomari lineage in Hinai, Yonaguni 比川与那國. These stones ensure fertility of crops, animals and people and the rain-prayer stone is particularly invoked in times of drought. Thanksgiving offerings of first crops are made to the ancestral deities who on this and all other occasions, when prayers are addressed to them, descend on the stone. The functions surrounding the prayer-stone in Sonai are public and presided over by the *noro* (ritual expert) and her male helper. In this particular case, the helper is the noro's husband, usually one of her brothers serves in this function. The proper observance of rites at the ancestral altar in Hinai is the sole responsibility of the Tomari family.

Menhirs in the use of 'ghost seats' are not unknown. They stand in the fields and are believed to be the resting places of the ancestors, whenever they chose to go abroad and look over their possessions. This function of the menhirs is, however, only known by the very old people and obtained from them after much prompting, since the informants fear the ridicule of their 'enlightened' offspring. One menhir, already half submerged in a field was pointed out to me by an octogenarian as a ghost seat, while his son later explained that it was a step stone for mounting a horse, which the inspecting Chūzan officials used to show off their superiority to the natives.

Thus the original significance of many menhirs has been forgotten, while some secondary use they have been put to lives on in the memory of the people. A good example is the menhir at Nikadori 荷川取, Miyako (Pl. V*b*), locally known as 'taxation stone'. This stone figures in tales about the tax levied by the Chūzan government. The stand of the stone is at present 142 cm. The tax collector sat on a nearby horizontal stone and the entire population was required to file past on the other side of the menhir. Whoever exceeded the stone in height, was considered sufficiently grown-up to pay his taxes. In times of slack business, the collector's assistant would, by a well timed kick or whack, ensure that this condition was fulfilled and internal revenue replenished! This drastic account of the secondary use this menhir was put to has apparently erased all memories of its original meaning.

The 'soul stone' at present near Nobaru 野原 hamlet, Miyako is an interesting example of a tradition still alive (Pl. V*a*). It is a perfectly finished cylindrical stone of a present standing height of 1·6 m. The circumference at the base is 4·18 m. and the stone is listed as 'cultural property'.

According to local tradition this stone once stood in Karimata 狩俣, where it represented the soul of the settlement, its ancestral deities. It ensured wealth and the well-being of this community. In the course of local feuds before unification of the island under Nakazone Toyomiuya 仲宗根覬親, Karimata was defeated and its stone removed to the summit of Nobaru dake (with 106·9 m. the highest elevation of the island). When the present USAF Radar Station (623 A.C. & W. Squadron) was under construction, the stone was to be pushed over the cliff by bulldozer. But as soon as this got abroad, the people of nearby Nobaru hamlet created an uproar; the plan had to be abandoned and the monument transferred to a site near this settlement. At the time of my visit, the stone which now represents the soul of Nobaru, was surrounded by a newly-made circle of coral blocks in a radius of roughly 3 m., kept free of litter and rank vegetation.

In this context, some interesting megalithic structures of Yonaguni ought to be mentioned, although they stress prestige, rather than the memorial aspect.

They are big tanks hewn out of the live rock which in their Ryūkyūan distribution seem limited to Yonaguni. An interesting tradition (informant, teacher Maetake of Hinai) about their origin which I collected was: 'Two Yonagunians went to T'ang 唐 (period) China (cp. 116) and were already given up as dead when, after many years, they unexpectedly returned. In celebration of their safe return a huge feast was given and at the end of it the whole village helped in making the first tank, the model of which the two travellers had seen in Fukien. But Mr H. Vetch has called to my attention that the name of the T'ang dynasty derives from an pictograph showing a pair of hands holding a pilon, tamping a hollow , and that when the character has the radical 土 *tu* (earth), 塘 it designated long ago and even now a tank, pool, or dyke.

At present such tanks are found in several wealthy houses of Hinai and Sonai, where they still have prestige value (Pl. VI*a* and *c*). I also found one together with a stone-wall, a half-submerged menhir and stepping stones at the abandoned Sakai village site (Pl. VI*d*).

Old people recall now their elders told them how these tanks were made and transported to their sites. Remarkably enough, this working process exactly corresponds to the one of the rock-cut sarcophagi of East Formosa (Kano 1930). Evidence of this working process is left lying about the Formosan countryside in the form of unfinished products. When the tank was finished, the whole village co-operated in its transport on log rollers. In appreciation the tank owner gave a huge feast to all helpers. One old lady who was told about this by her grandparents said to me: 'My word, all the oxen that went down the drain at such a time!' Killing of cattle for sacrificial purposes, or consumption by the guests, is, of course, a well-known feature at the erection of a megalithic monument in many megalithic cultures.

The dimensions of the tanks vary between: length 150–190 cm., breadth 80–150 cm., depth 30–70 cm., thickness of the stone 25–30 cm. It seems reasonably certain that tanks were still installed some 150 years ago, although we have no means to fix their earliest date. Exact parallels to these tanks and the sometimes beautifully finished stone troughs and stone mortars, universally seen on this island, can be pointed out from West Toradjas territory (Kruyt 1938: Deel Platen, pls. 69, 108, 109 110, 115), where, however, like Formosa, they appear to serve as coffins. Preservation of these important cultural assets, totally unknown to the Cultural Property Protection Commission at Naha, is imperative. Some of them have already been destroyed, because of the space they occupy.

ii. Tombs

In their present distribution the megalithic cultures are not associated with any particular disposal method of the dead. Multiple disposal methods are, however, found with some frequency. Concepts of death and the Beyond tend to be fairly uniform, equally the idea that dissolution of the physical and spiritual self according to certain rules (for instance ritual 'bone-washing') will ensure salvation. Fear of the dead is conspicuously absent from this way of thinking and any interpretation of the huges stones used in some types of megalithic tombs, as barriers between the living and the dead (Iha 1939: 43; Inamura 1958) is erroneous. On the contrary, the idea of the eternal link between past, present and future generations is nowhere better expressed than in the big megalithic lineage tombs, the loving care given to ancestral remains or the custom of letting the dead ancestors participate in the affairs of the living.

The existing literature about this area shows a total disregard of methodological and terminological principles (Inamura 1958; Kokubu 1963; Takiguchi in *Yaeyama* 1960). The redefinition and reconsideration of these structures is therefore necessary, even if tentative and provisional.

Following accepted archæological terminology, I define as *grave dolmen:* a structure consisting of four or more supporting boulders, or irregular blocks, forming a chamber, and a large cap-stone (Fig. 1). (*Memorial dolmen* do not usually form a closed chamber, their cap-stone being supported by two or more stones, often in table form, cp. Pl. VI*c*.) In our area the chamber is sometimes constructed from small coral blocks in dry masonry technique (Fig. 2). In most cases the fourth wall of the chamber is removable for the convenience of later entombments; with abandoned tombs it is missing. They then appear, were it not for the loose skeletons, or burial urns (Fig. 3), like memorial dolmen (Pl. III*c*). Where there is no material

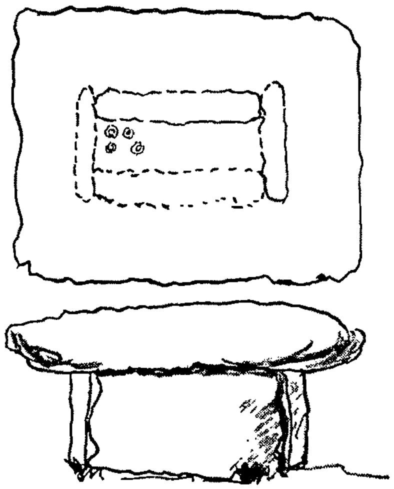


FIG. 1. Diagram of grave dolmen.

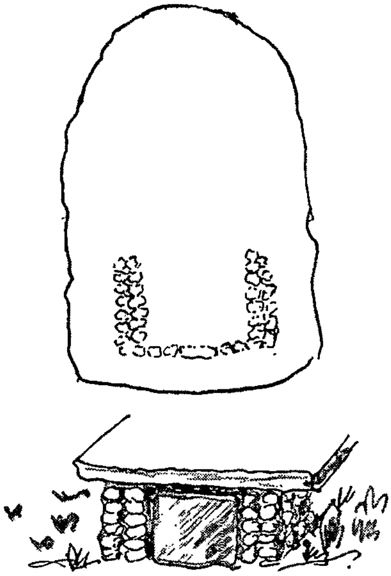


FIG. 2. Diagram of local variety of grave dolmen.

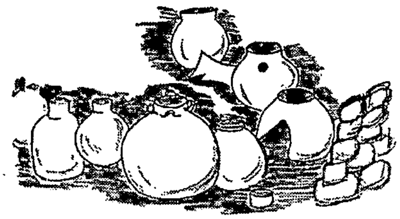


FIG. 3. Schematic sketch of partial view into tomb. Near abandoned Sagai village area, Yonaguni.

for a cap-stone, the structure has sometimes a thatch roof, for pre-bonewashing (cp. Kaneko 1961) (Pl. VIII*c*), and by coral stones for post-bonewashing (Pl. VIII*d*).

A typological relation of this type of grave dolmen to the transverse stone-chamber or transverse pit style tomb should be noted. The distributional area of these grave dolmens includes the islands of Miyako, Ishigaki, Irabu, Panari, Iriomote, Tarama, Kurimashima and Yonaguni in area C.

Stone cists are made of at least 5 or 6 stone slabs (bottom, four walls and cover), neatly joined in the form of a box. The cover fits the box, whereas for a grave dolmen it is usually irregular and projects over the stone chamber on all sides. Stone cists are so far only known from East Iriomote 西表東部 (on both sides of the road from Ohara 大原 to Komi 古見) Miyako and Irabu 伊良部, Kurimashima. In the Miyako islands they are found in groups, in quadrangular enclosures, formed by upright stone slabs.

In at least three cases (Figs. 4 and 5), Matsubaru 松原 objects B and C (Pls. I*a*, I*b*, I*c*), and Irabu island the enclosures are double and terraced. I, therefore, suggest the term *terraced tombs* for this variety (Fig. 6).

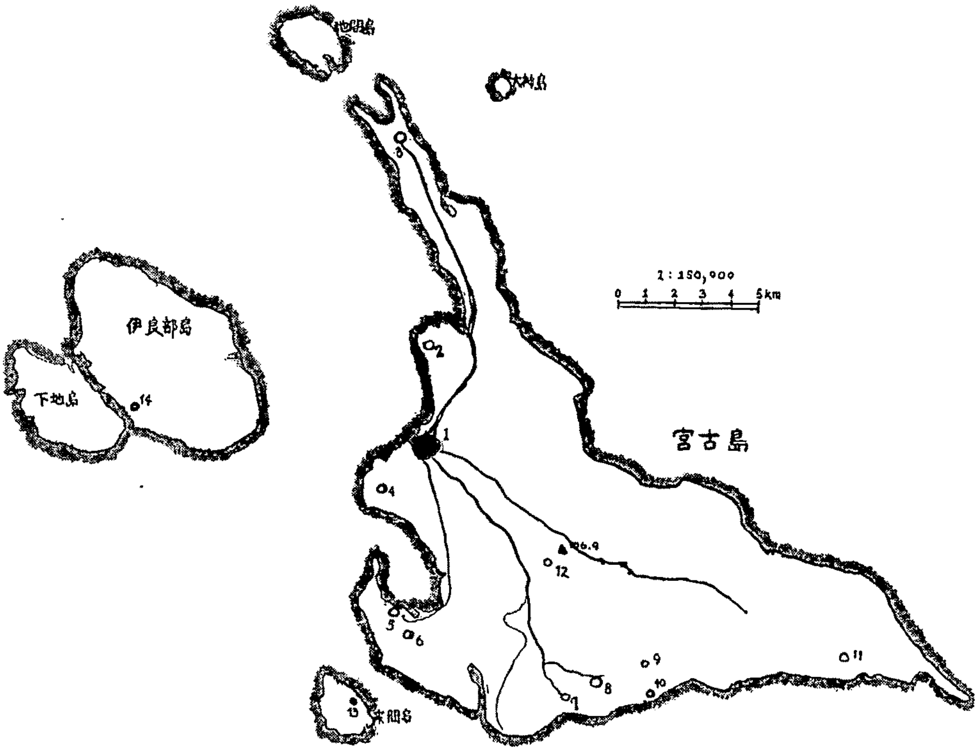


FIG. 4. Miyako Island.

1. Hirara town.
2. Nikadori.
3. Karimata.
4. Hisamatsu.
5. Tonaba.
6. Sugama.
7. Miyaguni.
8. Arazato.
9. Uruka.
10. Uipiya.
11. Bora.
12. Nobaru.
13. Kurima.
14. Aza Irabu.

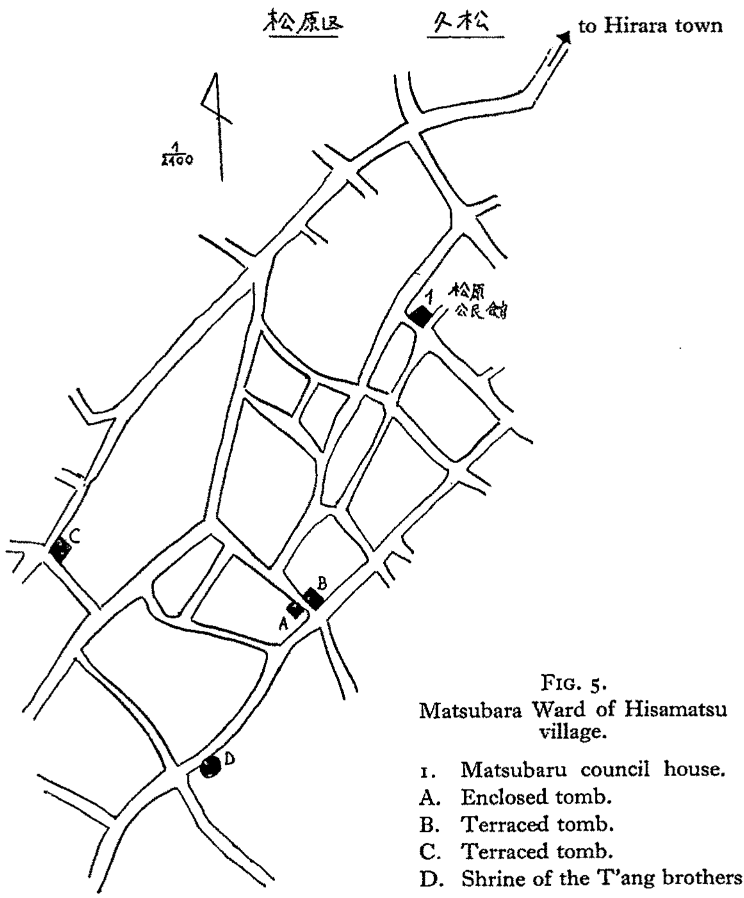


FIG. 5.
Matsubara Ward of Hisamatsu village.

1. Matsubaru council house.
A. Enclosed tomb.
B. Terraced tomb.
C. Terraced tomb.
D. Shrine of the T'ang brothers.

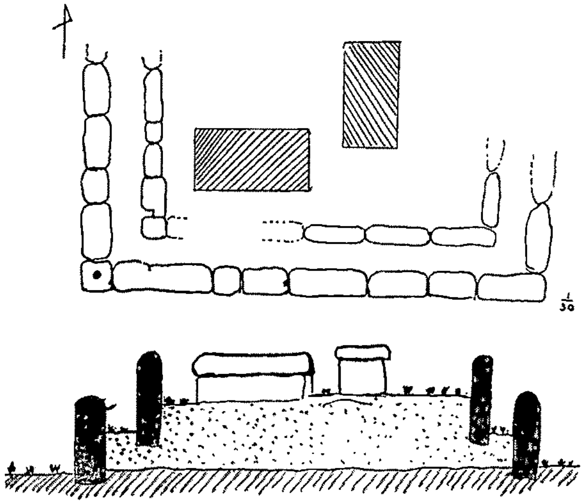


FIG. 6. Schematic sketch of terraced tombs.
(Objects B and C at Matsubaru, Hisamatsu, Miyāka at Irabu island, etc.)

Stepped tombs I saw only in Hirara town 平良市, Miyako. They are magnificently finished quadrangular enclosures dug into the hillside and in one case combined with a paved bathing place, even now used as especially beneficial—a prominent megalithic trait. The stepped pyramidal structure (Fig. 7) (13 steps in case of the Nakazone 仲宗根 lineage tomb) comes up to the crest of the hill and is crowned by a row of menhirs.

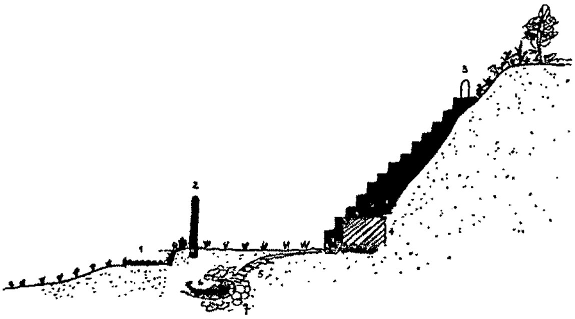


FIG. 7. Schematic Section of stepped tomb of the Nakazone lineage, Hirara, Miyako.

1. Road leading past the structure.
2. Surrounding wall.
3. Row of menhirs.
4. Chamber.
5. Stone steps leading to
6. paved well and bathing place.
7. Surrounding pavement.

Stepped platform tombs are found mainly in Ishigaki and Taketomi islands. They consist of a stone enclosure, usually provided with a magnificent stone gate and a stepped platform tomb of up to 5 steps (cp. tomb of Dakidō 西塘 in Taketomi 竹富, Yonaguni and Uesedo, 1957, photo 3). Nothing is known about the interior of such tombs (coffin? urn?) (Fig. 8). In construction and appearance this variety is curiously reminiscent of a chief's tomb from Yap (Hambruch, 1936, part 3).

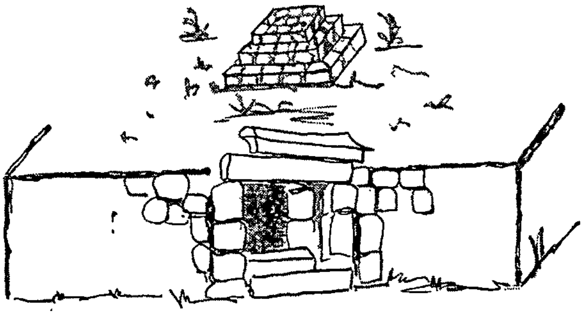


FIG. 8. Diagram of stepped platform tomb.

A further variety seen in only two instances on Kuroshima 黒島 are roof-shaped tombs, only recently emerged from the jungle. Remotely comparable structures. I only know from Soemba (Rouffaer 1937: 62).

I wish to draw attention to a big conical mound near Ku'ura 久宇良, Ishigaki island, near to two large grave dolmen, which, because of its regularity may be artificial. Pending further research, the question of burial mounds must be left open.

These varieties in the main cover all megalithic tombs so far known in area C, leaving a reasonable margin for local variations, due to lack of material, insufficient skill or economic strength to copy the model.

A direct evolutionary derivation of these tombs and the disposal method they serve (in all ascertainable cases multiple with the exception of spirit media, cp. Kokubu and Kaneko 1962: 112, 113, 114) from abandonment (Inamura 1958: 1) is absurd, quite apart from the fact that the existence of abandonment as independent simple disposal method (to be distinguished from exposure as first phase of a multiple disposal method!) remains to be proved.

Most of these megalithic tombs were still used within living memory, some of them serve to this very day. There is little doubt that they were only built for people of great social prominence and wealth, even the crudest of them mobilizing the efforts of a considerable number of people. One of their common characteristics is their location near the coast, since they consist of stones transported from the sea (coral rock) or even offshore islands.

The terraced and stepped tombs show a most skilful masonry. They, like the roof-shaped tombs of Kuroshima and the terraced platform tombs, can be traced to the kinship groups they belong to, since most of them are still in use, or were so within living memory. The Nakazone stepped tomb of Hirara town (Pl. III*b*) which I consider the local prototype, was erected in A.D. 1480 by Nakazone Toyomi-uya. Datings ranging from the end of the 15th to the end of the 16th centuries seem to be justified in all cases.

The grave dolmens present greater problems in dating. They are not documented as is the Nakazone tomb and since most of them are still used, or were used until a couple of decades ago, their inventory reflects phases of occupancy which nowhere antedate the stepped and terraced tombs. In short, there is at present no evidence for an evolutionary improvement in the sense of simple structures developing into complicated ones, as maintained by Inamura (1958). I suggest, on the contrary, that the lesser tombs are contemporary or even later than the superior ones; the differences in size, skill and material are due to the inferior social status and economic means of their tenants. Equally, the grave dolmen appear to be roughly contemporaneous, or slightly later than the more elaborate tombs. I base my opinion mainly on the fact that very crude grave dolmen are found with stone-cists or the roof-shaped tombs, within the enclosures. These grave dolmens demand less skill and money than the more elaborate structures and may have been used for less important members of the kinship group, or descendants at a time when the earlier skill was already lost, or their fortune could not afford them any more. The possibility that outside stone masons were called in for the superior work and that the crude ones were made by local craftsmen should be taken into account.

In summing up, we repeat that all megalithic tombs of area C appear to be roughly contemporary (15 and 16 centuries) with most of them still used by the descendants of their founders. Stepped and terraced tombs are limited to Miyako; stepped platform tombs are found on Ishigaki and Taketomi; magnificent, but very dilapidated stone cists can be seen in East Iriomote (Pl. IV*a*). In most of the other islands variations of the grave dolmen style were the most elaborate resting places for people of social consequence before the introduction of the South Chinese turtle-backed tomb or its variants.

A genetic relationship between the megalithic tombs of Northern Kyūshū and our area is assumed by Takiguchi (*Yaeyama* 1960: 172) and between northern Kyūshū, Korea and our area C by Inamura (1958). Typological similarities with our area C can, of course, easily be pointed out from prehistoric Korea. Even the stepped tomb has a magnificent forerunner in Tung Gou 通溝 of Koguryo 高句麗 times (Saitō 1961: 27–29). However, a thousand year gap lies between the megalithic tombs of Korea and Kyūshū and their latterday typological relations in the southern Ryūkyūs and therefore arguments about direct genetic relationship are futile. This time gap has prompted Kim Won-yong (1962: 6) to deny a megalithic status to the area C tombs, but this gap only exists when we limit our comparisons to the north. For chronological, as well as typological connections we must look to the south. Stone cists are still in use to this day in some tribal areas of Formosa (Kanaseki and Kokubu 1953: 80). We find in conception and execution many striking parallels with the living megalithic culture of the Kelabit in upland Borneo (Harrisson 1958), with Soemba (Rouffaer 1937), with the Toradjas of Celebes (Kruyt 1938), to quote only a few concrete examples from amongst what Harrisson (1958: 800) terms 'Heine-Geldern's general [and may I add, in some areas persisting] Dongson atmosphere for Southeast Asia'.

If we recapitulate our knowledge of Ryūkyūan disposal methods of the dead, we first note:

Burials in shell-mounds of the earlier shell-mound period (hypothetical mean date 200 B.C.). These are so far only known from area B.

Evidence for *prone burial in the sand of the beach* emerged during the 1960 survey of Yonaguni island. For reasons stated in the report (Kokubu and Kaneko 1962: 82–84) this site is as yet undatable, but appears to have been left by a population different from the recent one.

We are not again on firm ground until A.D. 1479 when Korean reports for Yonaguni indicate a disposal method little different from the recent one, practised with insignificant variations over the whole archipelago.

This *multiple* method consists of 2 to 3 stages. The first was and locally still is accomplished by temporary deposit in natural or artificial caves, the latter of the transverse pit style. Both varieties are fitted with wood or stone doors of sometimes considerable technical perfection. The second stage consists of ritual bone washing and deposing the bones contained in a jar, or loosely in the interior of the cave, or, alternatively, in little natural or artificial grottos in a cliff-face. In many cases there is a third stage, which consists in modern times (after the introduction of the turtle-backed tomb and other elaborate tomb-structures from South China) in emptying the contents of the individual bone-jar after a certain time, unto a general lineage ossuary. As pointed out elsewhere (Kaneko 1961) a spiritual promotion from dead soul to ancestor soul (individually recognized and paid homage to) to ancestral deity (anonymous) runs parallel to the three stages of physical dissolution.

Not only the recent tomb structures, but also the evidence of the cliff-side depositories strongly suggest this third phase (mixing of the individual remains with general lineage remains), or, alternatively, locally a further hidden deposit of some special parts of the body.

The unsatisfactory term *cliff-burial* 崖葬 is usually applied to this kind of deposit which is by many authorities considered to be a chronological and typological forerunner of the more elaborate transverse pit-cave deposit. However, here again, facts do not support the evolutionary sequence 'natural cliff grottos → artificial cliff grottos → natural caves → artificial caves → free standing tombs'. Caves and cliff sites are often simply two different locales for successive stages of disposal; and local variations the result of available cliffs and caves, fashions, personal preferences, differences in social status, etc. In concept and execution no fundamental change has occurred in the disposal method of the Ryūkyū islands at least since the 15th century. We find only one central theme (multiple disposal with bone-washing) with small variations. The question of whether deposit on cliff sites developed into deposit in caves does not even arise, because our problems lie elsewhere.

When and from where did this complex enter our area?

To follow 'traditional' methodological procedure, let us first look to the north. In Japan the transverse pit style as a natural cave fitted with a door, but apparently not connected with a multiple disposal method, coexists with burial mounds and was discontinued with them (Mizuno and Kobayashi 1959: 1009). It can therefore be hardly directly ancestral to our area.

Kokubu (1955: 1–10) reports a cliff-burial site from Yamagawa port 山川港, South Kyūshū, and mentions further sites in Hiuga 日向 and Oou 奥羽 provinces. This kind of disposal, according to him, is in use from between later Jōmon to early burial-mound periods in Japan, and in some way connected with the cliff burial areas to the south of Japan (Amami Ōshima group and the Ryūkyūs). According to the report, in Yamagawa a complete adult burial with mirror and sword fragments was excavated under a 2 m. layer, containing inarticulated human bones of 'later historic age', Iwaibe and Jōmon pottery. A connection with the cliff sites of the Ryūkyūs seems to me far from a foregone conclusion, because the term 'cliff *burial*' is fully justified in this Japanese instance, whereas from the Ryūkyūs, we know only cliff *deposits*.

Turning to China we find a wealth of records testifying for the antiquity of the multiple disposal method there, ranging from descriptions in the Later Han history to T'ang sources reporting the deposit of ritually cleansed bones in cliff grottos, and in Sung sources about a second disposal stage in cliffs or trees (see bibliography of ancient Chinese sources in Ling 1955).

A survival of this disposal method into our days is reported for the Chinese on Taiwan (Ling 1955: 175–177), Java (Königswald 1960: 169), Borneo (Harrisson 1962: 20) and Hong Kong (Wilson 1961: 120). On the Chinese mainland local contemporary existence is reported for the provinces of Kweichow (Beauclair 1960: 160), Hunan, Sikang, Yünnan, Kwangsi, Kwangtung, Fukien and Kiangsu (Ling 1955).

Prehistoric multiple disposal is indicated in the Niah Caves (Harrisson 1962: 7, 8, particularly pertinent N 24, N 28, N 30) and often identical with Ryūkyūan practices of uncertain or recent dates. Some of the Kelabit varieties of contemporary disposal methods (Harrisson 1962: 11, K 53, K 57, K 58, K 59) again duplicate our Ryūkyū material, as does local evidence from amongst the Toradjas of Central Celebes (Kruyt 1938). Even the above evidence for a tertiary 'hiding' phase has a parallel in Kelabit country.

The Chinese origin of this complex in the Ryūkyūs and surely also in Borneo, Celebes and all other areas cited, appears evident from the afore-mentioned data although the date of its arrival in our islands remains still quite unclear.

In any case, megalithic tomb structures entered our area later and were made use of for this type of disposal. This too has an exact parallel in recent Kelabit customs (Harrisson 1962: 11, K 50). When these megalithic tombs were no longer built by those able to afford them, they were replaced by the South Chinese turtle-backed and house-type tombs in use to this day.

Pending further research, I should like to put out the following working hypothesis on the megaliths.

The megalithic structures of Korea and Japan belong to late prehistoric and early protohistoric periods. The same is true of the southern Ryūkyūs, but the time lag of 10 to 15 centuries makes direct genetical relations unthinkable. The Ryūkyūan megaliths share typological traits with neighbouring areas to the north and to the south. Only in Southeast Asia, however, have megalithic cultures locally survived to times comparable with our area C dates. Therefore it is with these areas that area C megaliths are compatible both typologically and chronologically.

Stepped tombs:

Miyako island, Hirara town, stepped tomb of the Nakazone family (Fig. 7 and Pl. III*b*).

Miyako island, Hirara town, stepped tomb of the Miyagane family.

Miyako island, Hirara town, stepped tomb of the Hokama family (Pl. III*a*).

All these structures are well preserved and still in use.

Terraced tombs:

Miyako island, Hisamatsu village, Matsubaru hamlet: *Akoba-miyāka* (my Object A, cp. Figs. 4, 5, 6, 9, Pl. II*a*–*b*).

Stone cist surrounded by rectangular enclosure (5·20 m. by 3·80 m.) of one row of big upright stone slabs (thickness a uniform 30 cm. length variable, stone [Pl. II*a*] 2·40 cm. present height above surface uniform 80 cm.), showing an incline of up to 70°. (By virtue of the single enclosure, this object does not strictly qualify for inclusion under terraced tombs.) The stone cist has an outer length of 1·9 m., a breadth of 1·3 m., height of 55 cm. above the present ground surface, plus 14 cm. thickness of the cap-stone.

A space intentionally allowed for drainage is reported between the bottom stone and the west wall of the cist; the joining and masonry of the slabs is otherwise perfect. Inamura opened the stone cist in November 1958 and states that he only found four bone fragments (12–15 cm. long) (Inamura 1958: 11). From the inner length of the cist (136 cm.), he assumes interment in crouched position. Its use as bone receptacle only is also quite possible. There were apparently no funerary objects, save a few sherds outside of the cist. Inamura had the site designated as 'cultural property', but it is still a refuse dump, with no effort made to clear the vegetation. I am somewhat sceptical about the sherds found outside being assigned to the tomb, since my surface collection of sherds from between the stone cists of object C (which was and is a refuse dump) contains panari-like sherds, old and new Chinese trade porcelain, several kinds of Okinawan pottery and ware thrown there yesterday in a confused heap. The ancient and persistent habit of placing pottery at the side of tombs (cp. Pl. IV*a*) would, of course, speak in favour of Inamura's assumption.

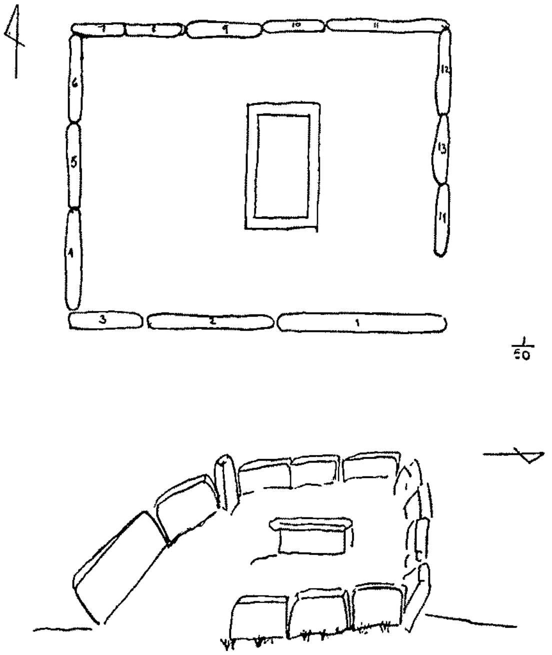


FIG. 9. Schematic sketch of object A (enclosed tomb at Matsubaru, Hisamatsu).

A few metres to the east of the site lies *Busagi Miyāka* (my object B, Figs. 4, 5, 6, Pls. I*b–d* and II*c–d*). Here a double enclosure contains three stone cists and several grave dolmens. I only managed to measure the full extent of the south wall 9·2 m., after a hasty clean-up of the rank vegetation. The measured distance between the first and second rows of stone slabs on the south wall is 95 cm., the gradient was not ascertainable. The outer wall has an incline of over 60°, forced out of plumb by being used as drying rack for hay and washing and the accumulated refuse (Pl. I*c*). The southwest cornerstone—not a stone slab with variable length and breadth, and a uniform thickness like all the others—is a menhir hollowed out at the top (incense burning?). Its masonry is markedly inferior to object A and amongst the walls visible at present, the south walls are better than the west walls which are fashioned out of coral blocks (Pl. I*b*).

Inamura reports two stone cists, presumably counting two adjoining stone cists (Pl. II*c*) as one. There is, however, a dividing wall between them. Inamura opines that these cists also once contained one or several skeletons, that they were used over a period of time and therefore were 'clan-graves'. Although he gives no reason for his opinion, I should agree with his second and third conclusion, since within the terraced enclosure there are indications of more tombs than just the cists visible at present. There is an obvious decline in material and workmanship (amongst the stone cists themselves and the crude grave dolmen) with the gradual passage of time. Two cists were opened by Inamura, but no exact report exists and inexplicably the site was not declared 'cultural property', like Object A.

Hisagai Miyāka (Object C, Figs. 4, 5, 6, Pl. I*a*). This tomb is reputed to be the resting place of feudal Lord Akaji Tataoya, father-in-law of Nakazone Toyomiuya.

Two level terraced tomb with stone cists and grave dolmen. Exact number unknown, since the whole area is buried under layers of refuse and jungle vegetation with severe damage to the superb masonry. The east-west extension of the outer enclosure is 8·20 m. the south-north extension 7·30 m. Inamura (1958), who is our only detailed source of information about these tombs, failed to notice that they are terraced and not two rows of stone slabs piled on the top of one another.

Funerary inventory. This forms a separate chapter in Inamura's report (1958: 21–35), but from his enumeration of the five kinds of pottery sherds and stone artifact it is quite impossible to assign them to any one of the three Miyāka. A depth of 90 cm. and a position north of the stone cist (which?) is given for a stone implement termed 'polished round axe'. A stone knife (slate), a perforated net sinker and various chipped implements are mentioned. I located the broken off butt-end of a polished adze with elliptical cross-section between two stone cists of Object C, lying on the surface, but in association with pottery sherds of diverse antiquity and origin. The stone material is eruptive rock, similar to the variety found in the Yaeyama islands, but as yet not clearly identified. The Geological Department of Tōkyō University kindly agreed to study the material, but was unable to identify the stones. The stone implements may be associated with the tomb as funerary inventory, but they may just as well be part of the refuse heap. Inamura's finds were apparently deposited in the Hirara Town Library but could not be located there, although the Library staff very obligingly helped me in turning their premises upside down. Unfortunately this situation is symptomatic of the archæological research done in most parts of the Ryūkyūs; it is left to well meaning, but untrained amateurs who never make accurate records of their activities and finds.

The three tombs should be immediately cleared of all refuse and vegetation. I should further suggest an exact record by trained draughtsmen once they are cleaned up. All three sites should be declared 'cultural property'. A 'no dumping' law should be proclaimed and monthly clean-ups enforced. These recommendations are easy to put through for Matsubaru is a model hamlet and very proud of its reputation.

In the long run all three tombs should be completely excavated and restored to their original appearance under expert supervision. Such a project, creating an open air museum, should prove popular with local authorities, because relatively inexpensive. It would also be of great scientific interest, since similar sites are not known in either Japan or Formosa. Miyako island, Shimoji-chō, Sugama 州鎌 village, *Oden-miyāka* rectangular enclosure (double?), partly paved floor-space, memorial menhir. Reportedly the superb stone cist was destroyed by Japanese garrison soldiers. At present only the enclosure (9·10 × 5·50 m.) showing superior masonry is intact. Anji (Lord) Oden is a contemporary of Nakazone Toyomiuya and was greatly honoured for having constructed the stone-bridge of Shimoji 下地. Lesser miyāka either in size or execution are found in Hirara town, Shimoji-chō, Yonaba 支那バ hamlet, Ueno 上野 village and the Arazato-Miyaguni 新里—宮國 area (cp. Fig. 4).

Irabu 伊良部 island, Irabu village, 330 m. east of Aza Irabu *Susabi miyāka*. Two level terraced tomb. Outer north-south extension 7·3 m., inner extension 3·60 m. Outer east-west extention 11 m., inner enclosure 7·30 m. At least three stone cists and three grave dolmens, presence of more suspected, but not ascertainable, because site is completely overgrown. Since it is, however, less disturbed than the Matsubaru sites, thorough clean-up and excavation should prove rewarding. An 80-year old informant said that the descendants of the occupants of this tombs had the duty of calling on its last ancestor buried and report to him on their business, every time they passed the structure. This custom seems to have been discontinued about 50 years ago.

Similar structures are also reported from Kurimashima 来間島 and Tarama 多良間 islands.

Grave dolmen: Three or four grave dolmens (Pl. III*c*) 500 m. east of Susabi miyāka. The entrance walls which in all cases were removed by stone crushers, revealed cleansed bones of several individuals, burial urns and ceramic funerary objects. Preservation of this site, still used a couple of decades ago, seems desirable, though it may already be too late.

Panari island, Kanji 上地. Grave dolmen with two level enclosure at Odōbaru. Locally reputed to be connected with a potter.

Ishigaki island, south of Ku'ura hamlet. Two grave dolmens containing cleansed bones of several individuals, burial urns and ceramic funerary objects. In good repair and relatively safe, since location is rather remote. Grave dolmens are also reported near Kabira 川平 village, but were not seen by me.

Further grave dolmens are in several locations of Ishigaki, Yonaguni and Iriomote (East) islands.

South of the road Ohara 大原—Komi 古見 in East Iriomote I found several *stone cists* within an area of several kilometres. They are not enclosed like the Miyako stone cists (Pl. IV*a*). Although used until relatively recently, their state of repair is very poor due to the vegetation forcing the stones apart. Some cists were cut in half during road construction for the local branch of the Okinawa Pine Corporation and others are destroyed by schoolboys who are not taught to respect their cultural heritage in their plays.

In the jungle south of this road *terraced platform tombs* were found, but since the dense jungle vegetation allows none but a crawl approach, neither photographing, nor measuring was possible. Preservation of at least a representative number of these sites is desirable, but probably overruled in the present zeal for technological progress and modern living standards to which the cultural inheritance of the past is mercilessly and unnecessarily sacrificed.

Roof-shaped tombs of Kuroshima, Issantsaya (Pl. IV*b–d*) only recently emerged from the jungle. They are so far unique in this area. Locally they are thought to be, like all other outstanding tombs, *Yamato baka* 大和墓 the resting places of warriors of the Japanese Heike 平家. Close investigation revealed that they were connected with an Okinawan *anji* (noble) in disgrace, who had been cast adrift as punishment; but later made himself master of small Kuroshima. According to genealogies, which tend to become somewhat unreliable when concerned with persons alive before the big tidal wave of A.D. 1771 destroyed all records, I suggest a date near the end of the 16th century for these tombs. The roof-shaped tombs are walled in by an elevated enclosure which also includes grave dolmens.

iii. Assembly places

All *ugan* (utaki), or sacred shrines of the indigenous Ryūkyūan religion come with very few exceptions into the category of assembly places: ritual, council-meetings, courts-of-law, dancing, feasting.

They are terraced quadrangular enclosures surrounded by stone walls and entered through a stone gate. The stone gate consists of two upright stone slabs or coral-stone pillars and a cap stone, recently often replaced by a concrete slab (Pl. VII*d*). These enclosed 'shrines' show the same architectural features as the enclosed tombs: enclosed by stone walls, terraced, with gate entrances (in the case of some of the enclosed tombs, the terrace finish sometimes reflects the grandeur of the occupants). The Ryūkyūan assembly places can only be termed shrines, if we dissociate them with concepts of shrine edifices, as seen elsewhere.

The *ugan* is usually divided into front court and sanctuary, the latter at least one level higher than the court and reached by a few steps and, often, a further gate. The sanctuary only contains the altar, a further low stone platform, or a table dolmen (Pl. VII*a*), sometimes with a small upright stone representing the ancestors (Pl. VII*b*). Close parallels in concept and execution of these altars with the combined 'earth-ancestral altar' of tribal Formosa (Paiwan, Rukai) must be pointed out. There these altars are claimed to be a survival of identical structures and practices in ancient China (Ling 1958).

Ryūkyūan *ugan* have been divided into genuine *ugan* and those erected for reasons of political expediency in later times (Nakamatsu 1961: 26). Nakamatsu's (1961) contention, that the genuine *ugan* are connected with the deposit of certain ancestral remains, is fully supported by our evidence. Considering the general spiritual climate, it is not at all surprising that local guardian (earth) deities turn out to be deified village founders or distinguished leaders, our overwhelming evidence is that their remains are actually hidden within the sacred enclosure. This presence is very often not known to all and sundry and rarely disclosed to outsiders. Nakamatsu connects the widespread tabu of entering an *ugan* with these secret deposits. I know of some cases where not only the founder's, but also his wife's remains are revered and actually deposed within the precincts of the shrine.

On many islands shrine membership is hereditary and seniority amongst the village *ugan* observed. The shrine commanding the greatest prestige is naturally that of the village founder.

In short, the Ryūkyūan *ugan* belongs no doubt to the category of megalithic assembly places found in ancient China as well as in later distribution over wide areas of Southeast Asia and the Pacific islands.

iv. Semi-profane or profane function structures

These are paved communal bathing places, wells, bridges, paved pathways, stairways, fortifications, stone gates, stone troughs, etc. These are everywhere, their functional use now profanes their original ritual significance. I shall therefore only deal here with two rare varieties which have gone unreported so far.

Stone fortifications can sometimes be seen in connection or not with the former castle sites of Area C. Plate VI*b* shows the stairway to a coastal watch-tower on Aragusuku island, Kanji 上地, which according to report was constructed by order of the Chūzan government to control maritime traffic. When ships were sighted, they had to be reported by a relay system of watch-towers. Since watch-towers in most cases are not in sight of each other, the towers may have served a different function.

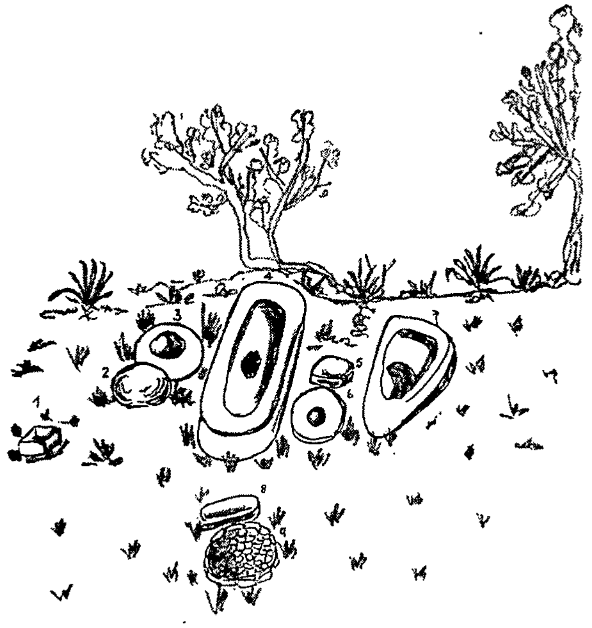


FIG. 10. Schematic sketch of 'indigo dying plant', abandoned Sanal village site, Yonaguni.

1. Fireplace.
2. Stepping stone.
3. Stone trough.
4. Stone trough.
5. Stepping stone.
6. Stone trough.
7. Stone trough.
8. Stepping stone.
9. Paved well.

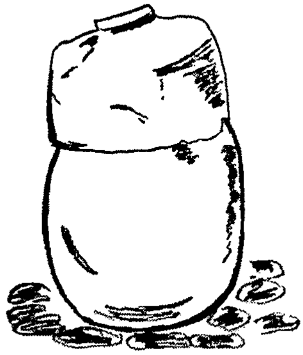
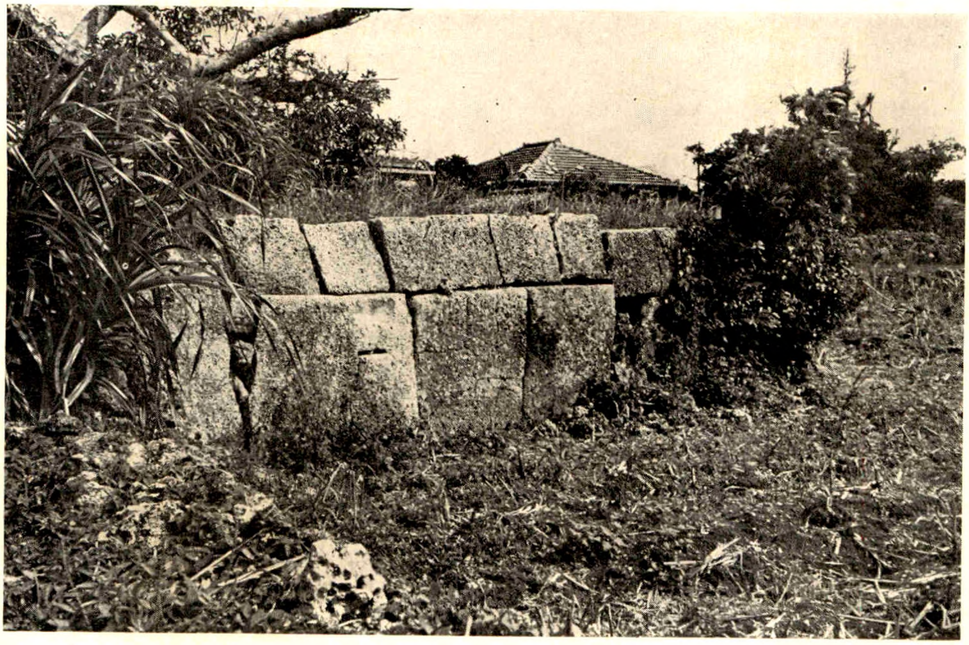
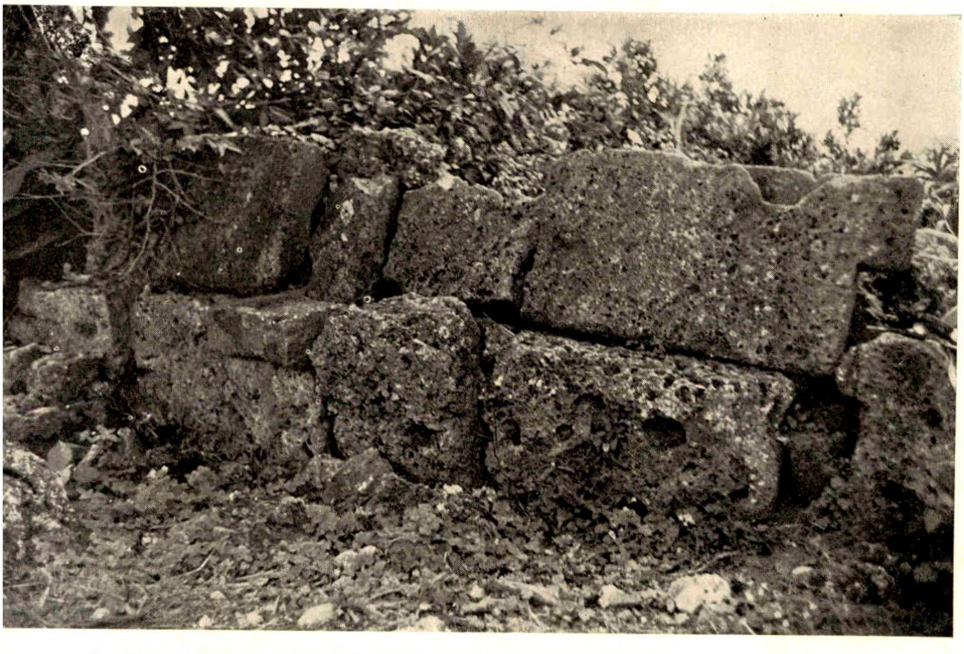


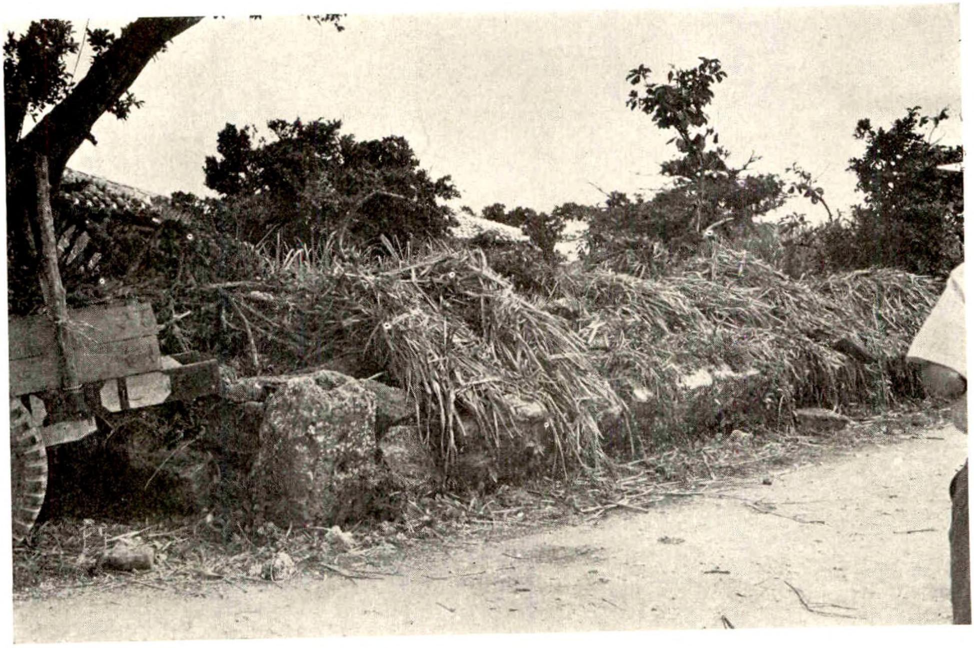
FIG. 11. Burial urn found in Arakawa, Ishigaki island.
(Sketch after photograph in Rev. Anmuro's possession, Ishigaki town).



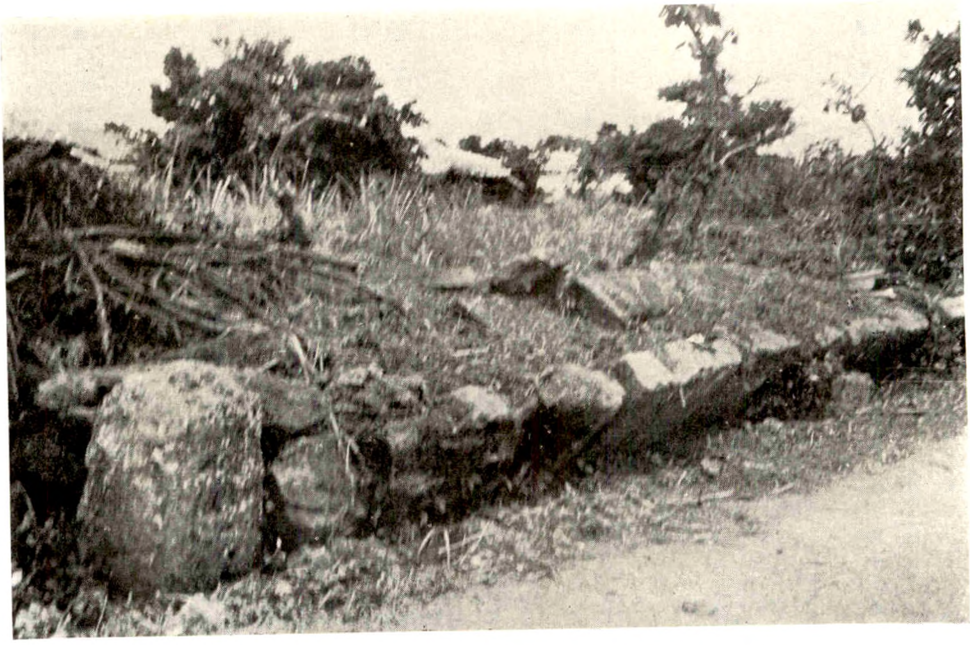
a. Hisagai Miyāka (Object C). South wall Matsubaru hamlet, Hisamatsu, Miyako island (see pp. 123, 130, 131)



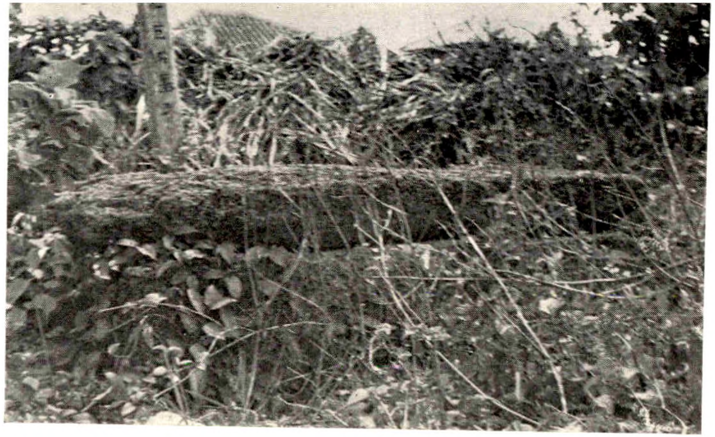
b. Busagi Miyāka (Object B). West wall, Matsubaru hamlet (see pp. 123, 131)

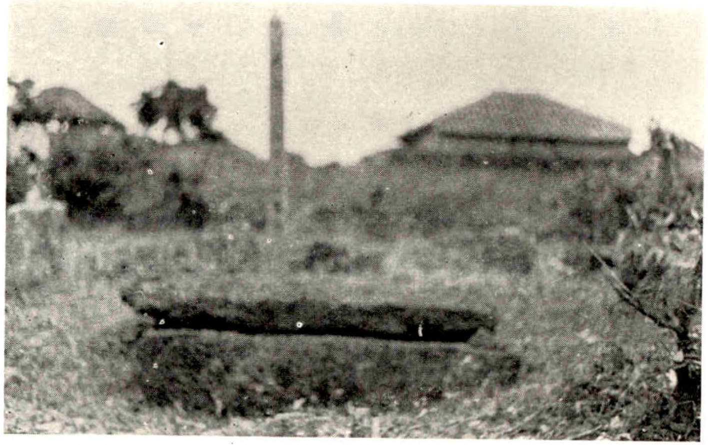


c. Busagi Miyāka (Object B). South wall before cleaning (see pp. 123, 130)



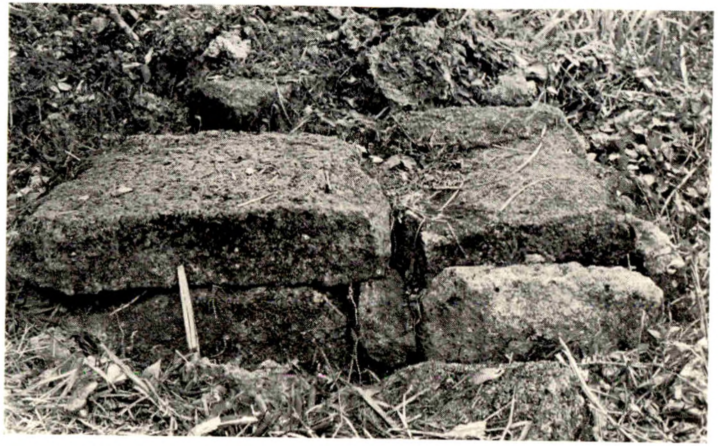
d. Busagi Miyāka (Object B). After cleaning (see p. 130)

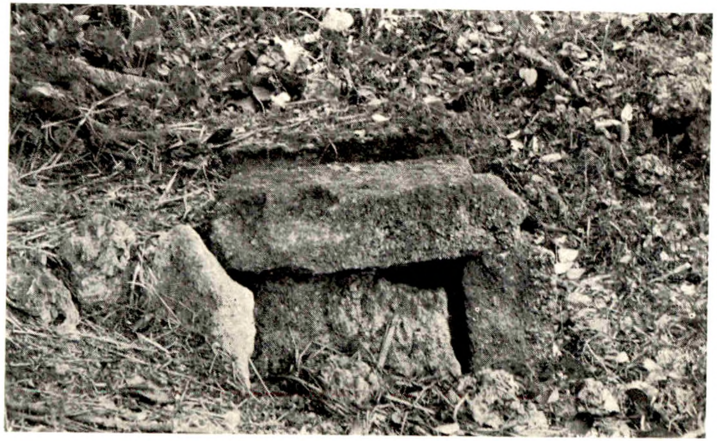




a. Akoba Miyāka (Object A). Stone cist before cleaning, Matsubaru hamlet, Hisamatsu, Miyako island (see pp. 129, 132)

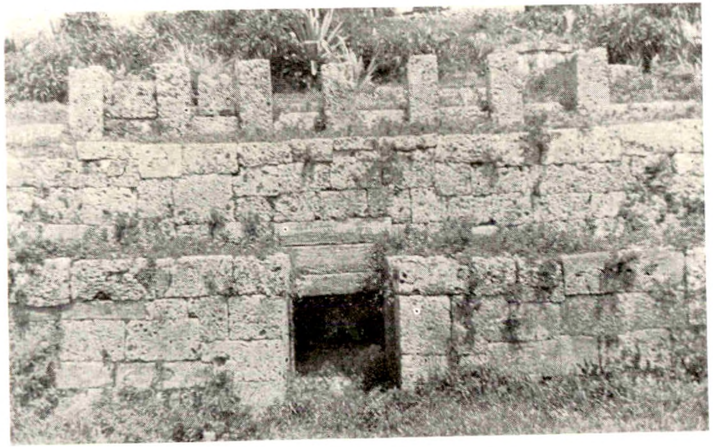
b. Stone cist and enclosure Matsubaru hamlet.

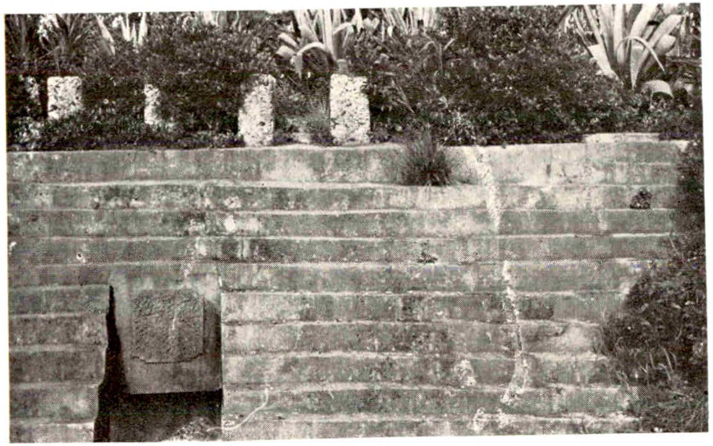




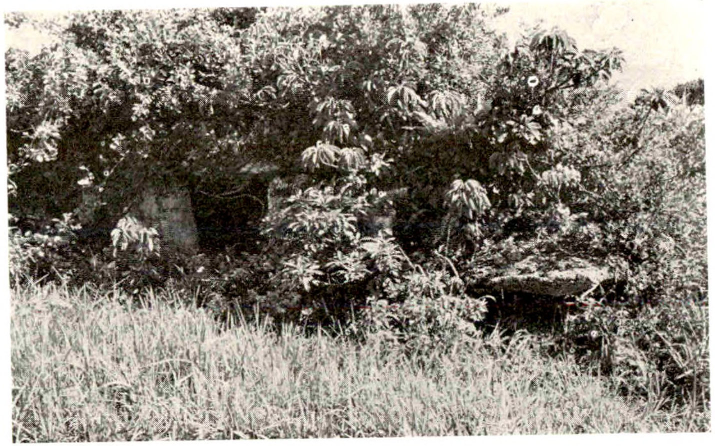
c. Busagi Miyāka (Object B). Stone cists, Matsubaru hamlet.

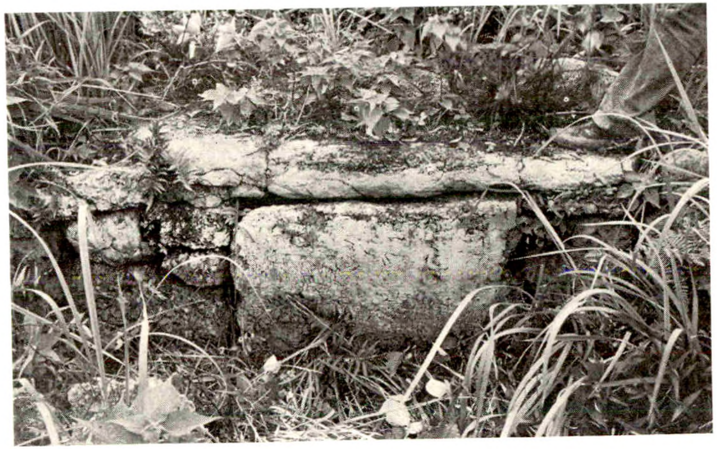
d. Busagi Miyāka (Object B). Stone cist, Matsubaru hamlet (see pp. 130, 131)



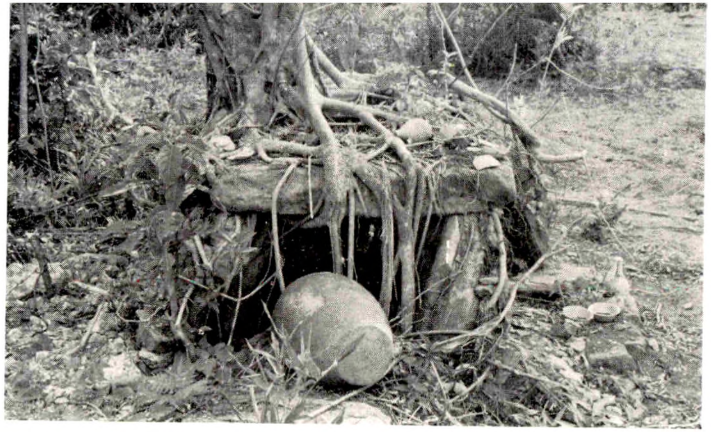


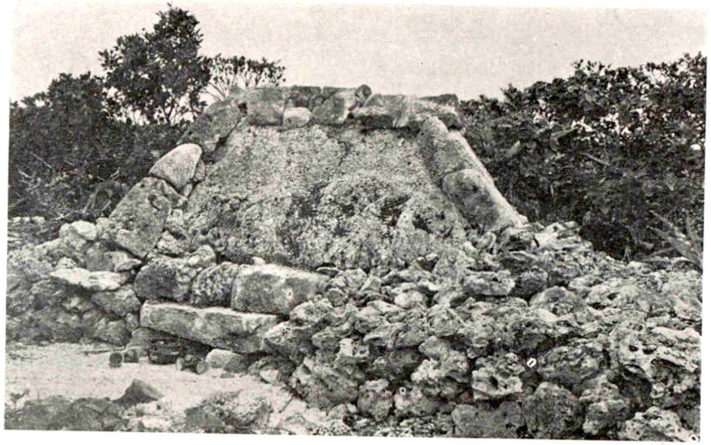
a. Lineage tomb of the Hokama family, Hirara town, on Miyako (see p. 129)
b. Partial view of the Nakazone lineage tomb, Hirara (see pp. 126, 129)



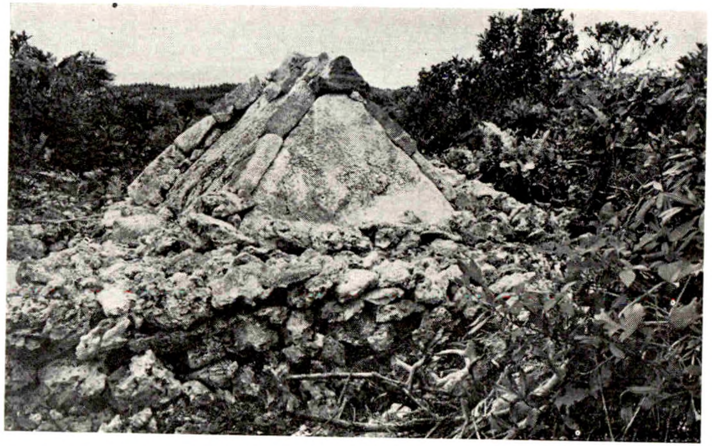


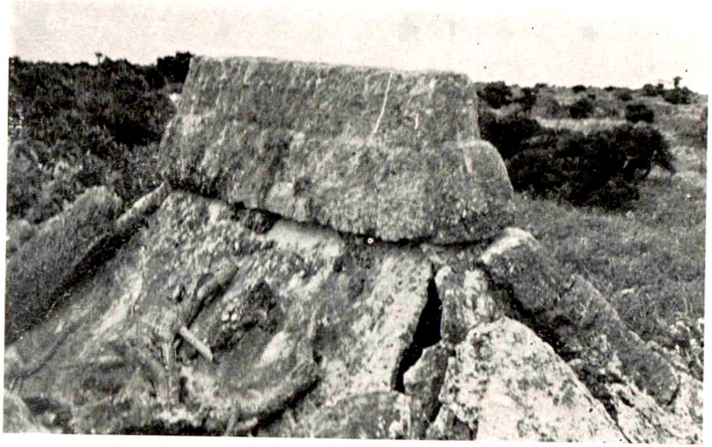
c. Grave dolmen near Aza Irabu, Irabu island (see pp. 122, 132)
d. Grave dolmen near Ku'ura, Ishigaki island



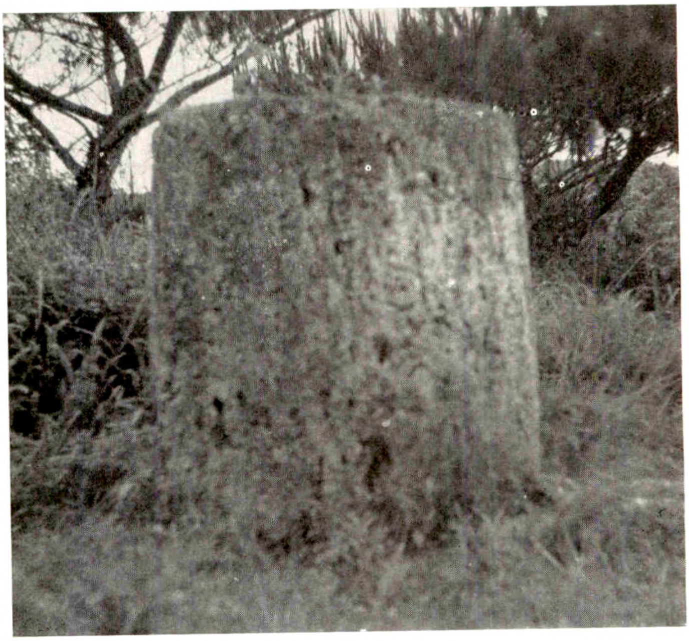


a. Stone cist near Komi, East Iriomote island (see pp. 127, 130)
b. Roof-shaped tomb of Issantsaya, Kuroshima, seen sideways.

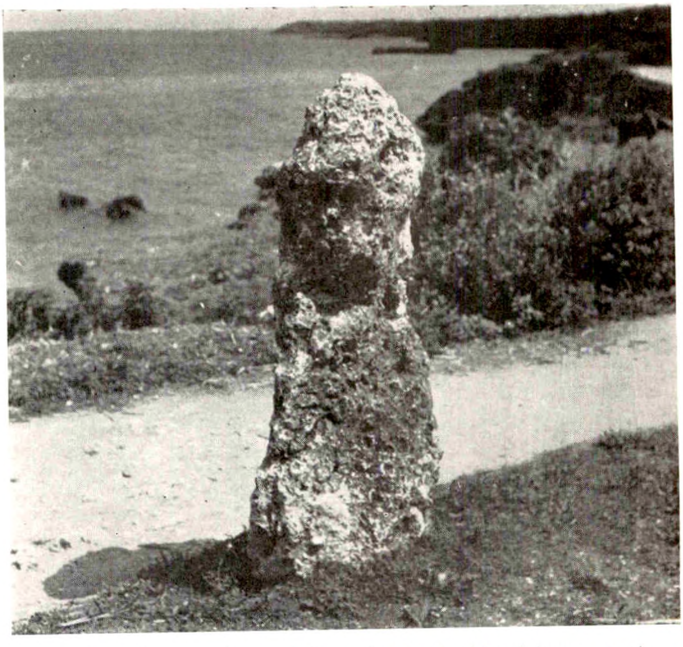




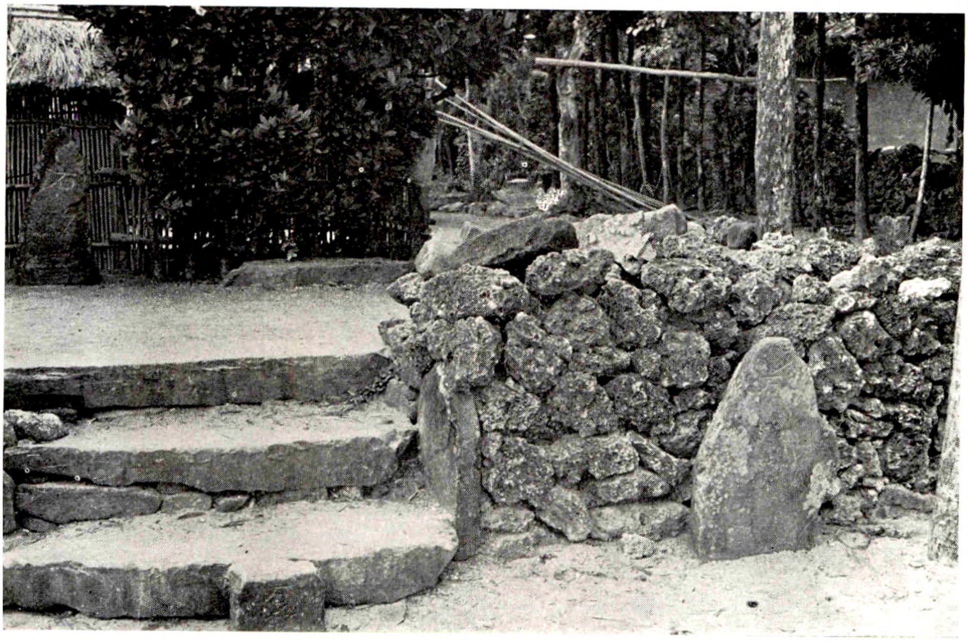
c. Roof-shaped tomb of Issantsaya, Kuroshima, seen end on.
d. Second roof-shaped tomb of Issantsaya. (See page 133)



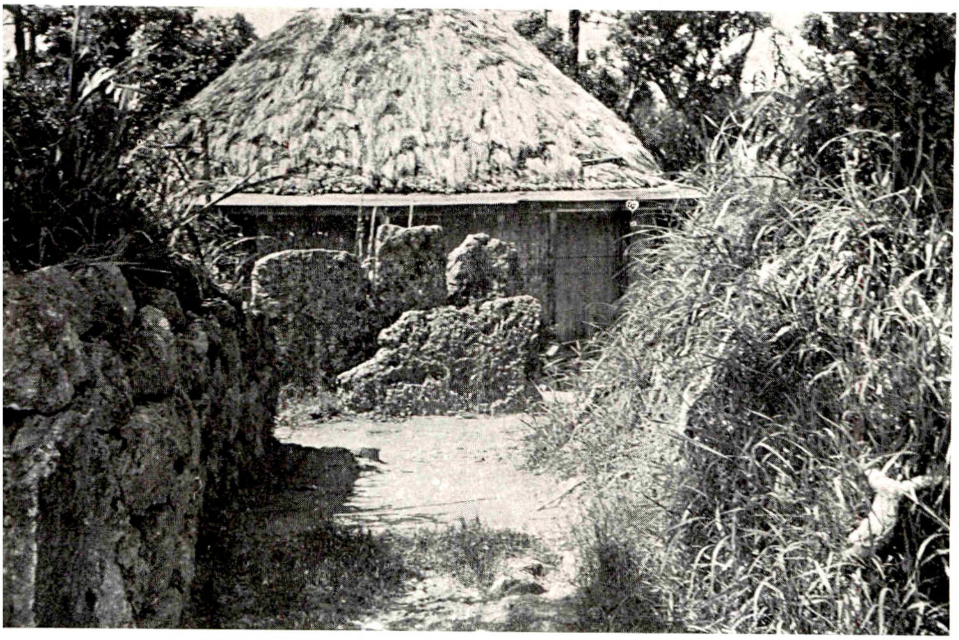
a. 'Soul-stone' near Nobaru hamlet, Miyako island (see p. 120)



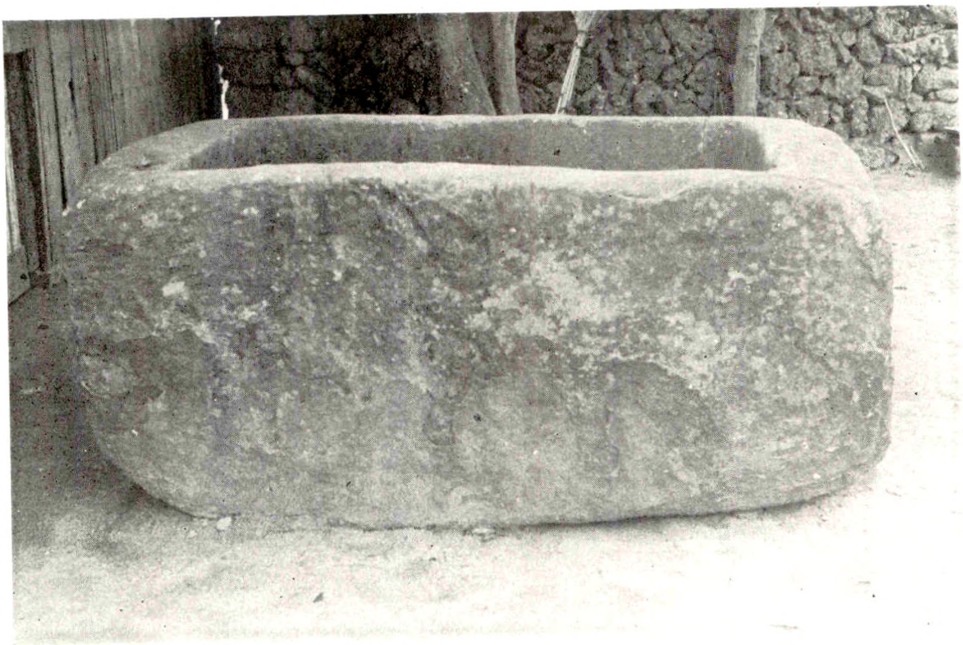
b. 'Taxation stone' near Nikadori, Miyako island (see p. 120)

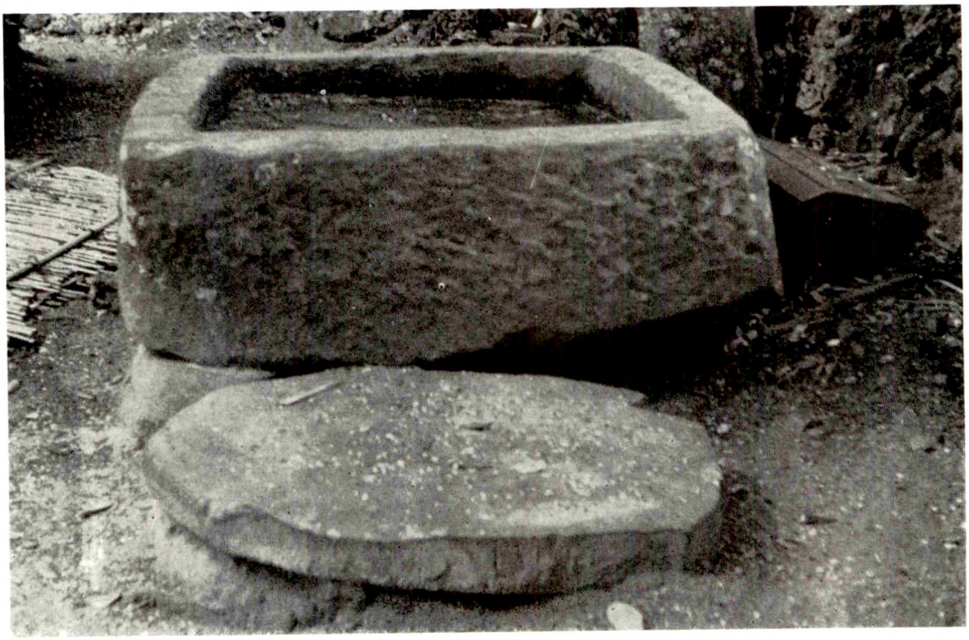


c. 'Magic obstacle' menhirs in Sonai, Yonaguni island (see p. 119)

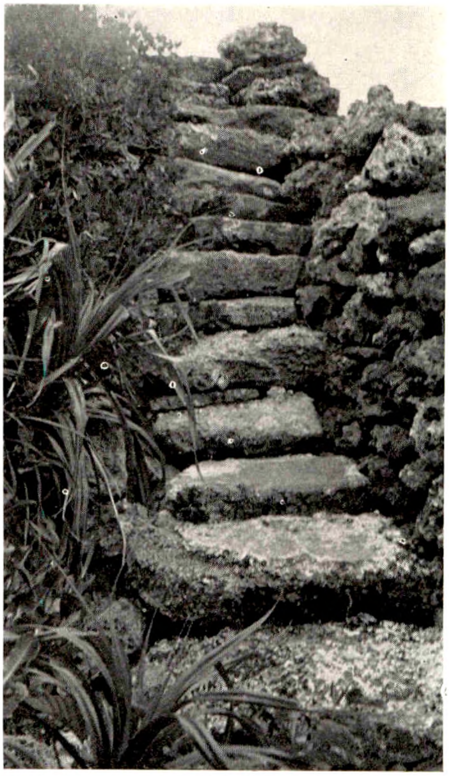


d. 'Ghost-wall', Nakagusuku village, Okinawa island (see p. 119)

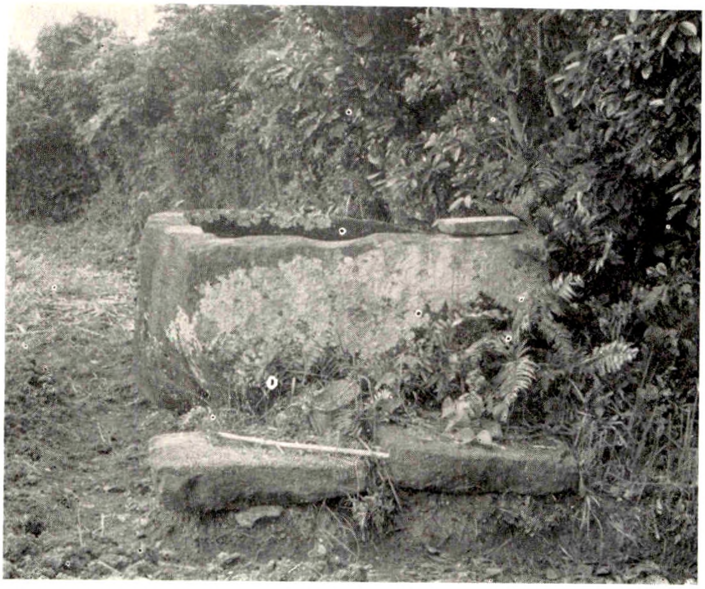




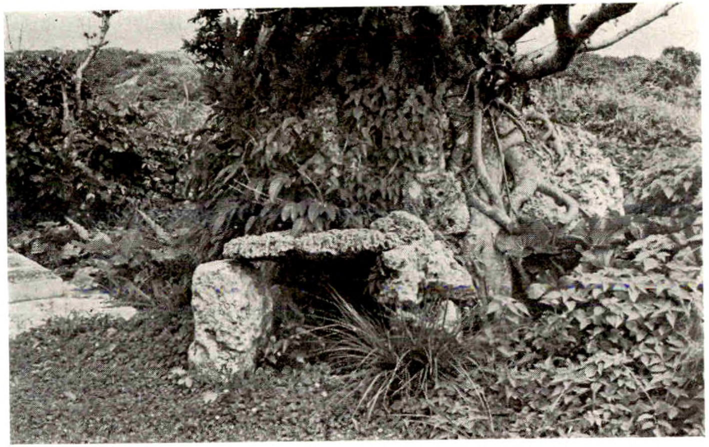
Prestige tanks on Yonaguni island at *a.* Sonai *(above)*; *c.* Hinai *(below)*. (See pages 121, 122)

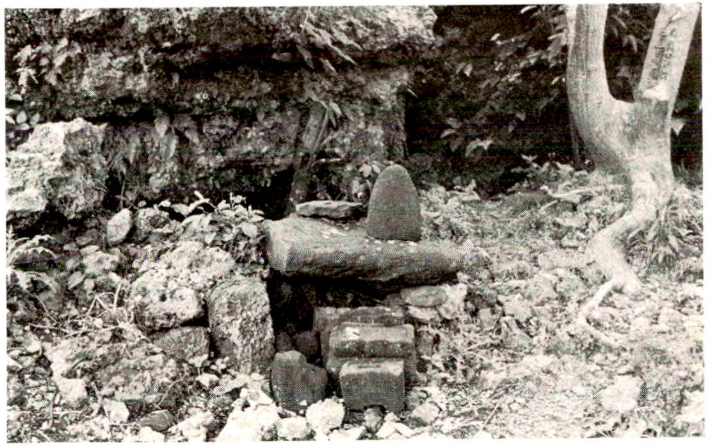


b. Stairs to watch-tower, Kanji, Aragusuku islands (see p. 133)

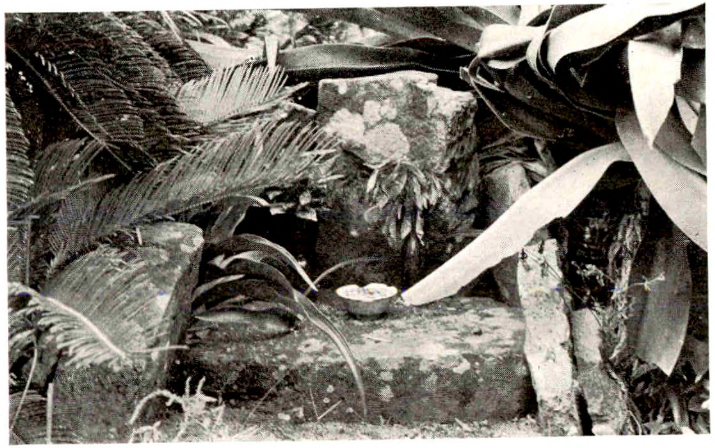


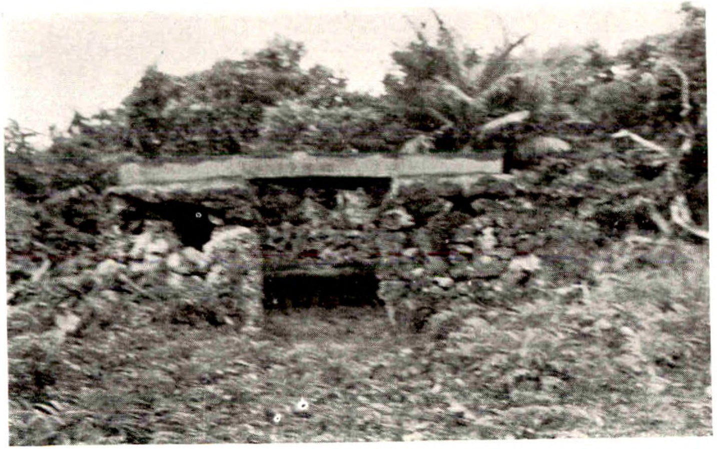
d. Prestige tank abandoned at Sakai, Yonaguni island (see p. 121)



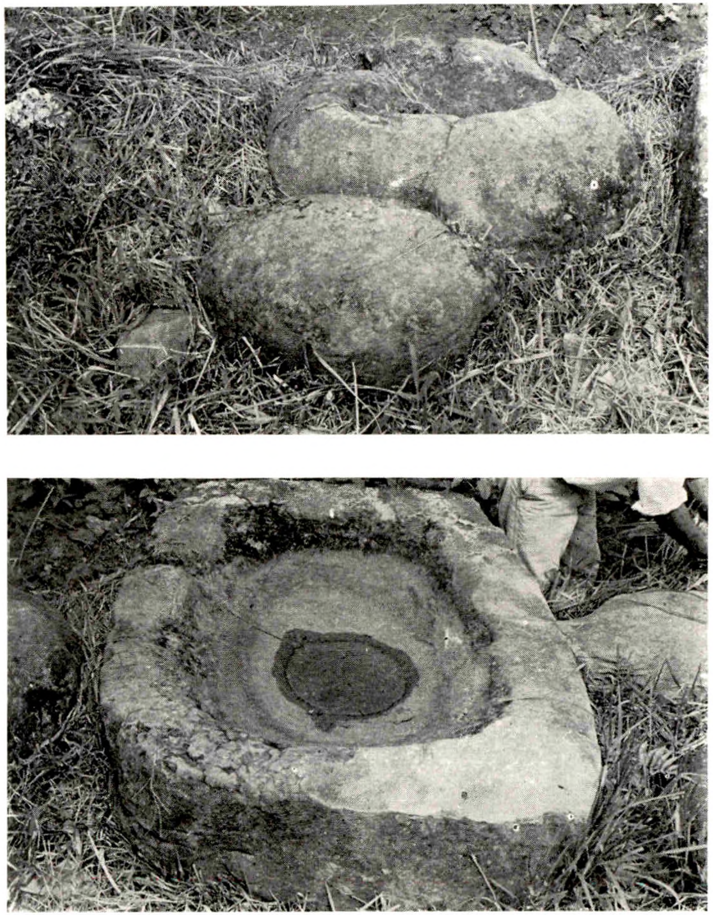


a. Table dolmen as altar, near Komesu, southern Okinawa (see p. 134)
b. Ancestral altar, near Gushichan, Okinawa (see p. 134)

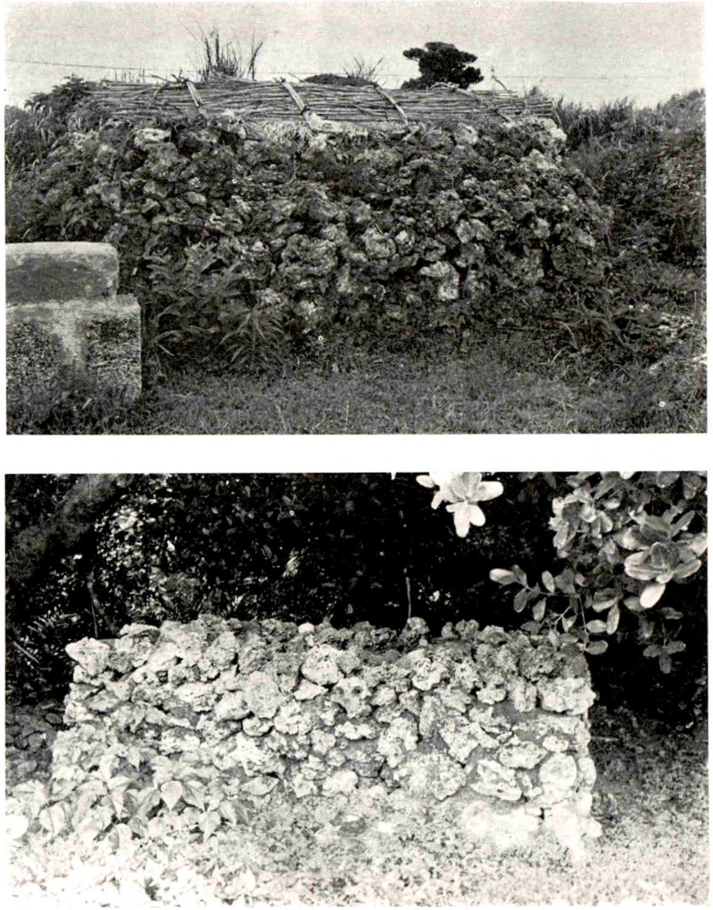




c. Ancestral altar, Hinai, Yonaguni island.
d. Ugan gate near Nobaru, Miyako island (see p. 134)



a., *b.* Indigo dyeing plant (?), near abandoned Sakai, Yonaguni island (see page 133)



c. Thatched tomb (pre-bonewashing), Miyara hamlet, Ishigaki island.

d. Coral block tomb (post-bonewashing) Kabira, Ishigaki island(see p. 133)

A strong system of stone fortifications, which were razed, is traditionally reported from Karimata, Miyako. At present only one of the three narrow entrance gates to the village is left.

In the area of the abandoned Sakai village on Yonaguni I found a collection of stone troughs of various shapes and sizes connected with a paved well and a fireplace. A farmer working on a nearby field volunteered the information that this was an indigo dying plant, which seems very likely (Fig. 10, Pl. VIII*a*–*b*).

This initial investigation of megalithic structures in the southern area of the Ryūkyū islands will have to be further studied *in situ* and broadened in scope to include all of the Ryūkyū islands, a task requiring a team of several trained archæologists, ready to recognize all manifestations of the megalithic movement. No answers can be given yet, but a series of questions has been put. Relations of the southern Ryūkyū megaliths with Southeast Asia emerge clearly, although details still elude us and await clarification.

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3

Philippine Notes

WILHELM G. SOLHEIM II

The several items of new data and observations on prehistoric artifacts from the Philippines, presented here, have to do with pottery and metals, and relationships among the Philippines, Malaya and the Mekong Delta.

POTTERY

Fitted lids of earthenware

Among the Kalanay Complex pottery of the Philippines are common forms which have been interpreted as lids (Solheim, n.d.): some would fit down over and encircle the rim of a vessel and others fit the inside rim in the manner of a plug. Without strictly standardized sizes it is likely that when a lid was made it was to fit a specific vessel. In the finished pair of vessels the slight irregularities in the respective rims might require a bit of juggling between the two for the best fit but with small size and weight this would not be difficult. In a vessel of large mouth diameter, say about 25–30 cm., it would become quite a problem. To slide the lid around the rim or in the mouth of a large vessel for a fix, while smoothing the two surfaces in contact, might lead to breakage as irregularities in their diameters might get both wedged. A simple way to solve this problem would be to put some distinguishing mark at matching points on the lid and vessel to indicate the position of best fit. This was apparently done on a pair of vessels recovered from a site in the Philippines.

The Guthe Collection, gathered by Carl E. Guthe and now in the Museum of Anthropology of the University of Michigan, has a large number of sherds of Kalanay Complex pottery from a site of unknown location; they represent several large vessels from 40 to 100 cm. in diameter, including a pair, one apparently a lid for the other (No. 71 and 74, Solheim, n.d.; fig. 27*c–d*). There were pairs of circular perforations through the rims of both vessels such as could serve to fasten them together. There were good indications that a second set of matching pairs of perforations were present on opposite sides of the circumference of the vessels. Between one pair of perforations on the lid (No. 71) there was an open incised triangle pointing down. On the bottom vessel one pair of perforations had no incision but one rim sherd with a portion of a perforation showing (No. 74) and by all indications from the same vessel, had a small triangle incised on its edge. When I was working on these sherds this seemed to me to mark the corresponding place on the lid which fitted the lower vessel.

This hypothesis was recently partly confirmed. Plate I*a* shows a carved wooden box from Ifugao, Mt. Province, Philippines, which was used as a container for ceremonial paraphernalia. Although I purchased the box in 1954, I did not notice the two pairs of circles carved on the side of the lid and bottom, until some months ago. When the paired circles are matched the lid fits the bottom nicely, but when placed with the circles on opposite sides it does not fit well and if pressed on to the bottom it gets wedged and is difficult to remove.

Slim River pottery relationships

G. de G. Sieveking, in his recent article on 'The Iron Age Collections of Malaya' (1962) twice remarked on the close relationship of Slim river pottery to some Philippine pottery. He bases this hypothesized relationship primarily on the similarity of paste and possibly also on slip and form. His first statement is that 'Identical red or yellow sand-tempered wares, covered in many cases with a black bituminous slip, have also been found at the Iron Age dwelling site at Novalitches [Novaliches] in the Philippines (Otley Beyer's sites I and II "slipped" and "unslipped" wares, University of Malaya coll., Singapore). It is clear that the sites in Java and the Philippines must be closely related to those in Lower Perak' (*ibid.:* 91). His second statement is that 'Though isolated examples of this iron industry are known from southern Indo-China and the Malayan industry should be related with this region, since its distribution suggests a northeastern landing place, it is clear that this spread was only part of a wider series of emigrations in South-East Asia attested by the presence of Slim River pottery in Java and the Philippines . . .' (*ibid.:* 122).

Sieveking apparently presumes this relationship on observations made of a few examples, probably sherds, in the University of Malaya collection. I suspect that only sherds were examined as even the primary collection of Beyer's in Manila contains very few whole vessels. Sieveking does not refer to the only published illustration of this 'Iron Age' pottery (Beyer 1947: pl. 14). From this illustration and the number of illustrations of pottery of the Novaliches Pottery Complex presented by Solheim (n.d.: pl. 36–38) since Sieveking's article appeared, there is little if any similarity between the Slim river and the Novaliches pottery. Further, the prehistoric iron artifacts found in the Philippines with one exception presented below, show no relationship to the prehistoric iron artifacts of Malaya. Thus, for the sites with Novaliches Complex pottery at least, no close relationship is indicated with the sites in Lower Perak.

On the other hand, there is a general similarity in the forms of the Slim river pottery with the pottery of the Kalanay Pottery Complex of the Philippines. The majority of the Slim river forms illustrated (Sieveking 1962: pls. 7–9) are duplicated by common Kalanay Complex forms (Solheim 1961*a*: 160–161). The two vessels from Java that Sieveking uses to suggest the relationship of Slim river pottery with the Javanese pottery (1962: 90, fig. 5) are also similar to Kalanay Complex forms. However, the iron artifacts associated with the Kalanay Complex pottery are not similar to those of Malaya, with the exception mentioned.

If there were a series of 'Iron Age' emigrations in Southeast Asia (one of which brought the Slim river pottery and iron to Malaya) they were not closely related to each other, or at least, the one going into Malaya had a different content than did the iron using cultures of the Philippines.

Metal

Iron artifacts from Philippines, Malaya and the Mekong Delta

No attempts have been made to put together the information on the iron artifacts recovered from prehistoric sites in the Philippines. The earlier reports picture about 35 iron artifacts (Beyer 1949: fig. 9; Beyer and de Veyra, 1947: 35; Fox, 1959*a*: pl. 1 and 29; Fox 1959*b*: pls. 14, 15, 163, and 164; Solheim, 1951: fig. 8; Solheim, 1961*b*: pl. 8*d*). My study on the Central Philippines (n.d.: pl. 8 and 46–48), which should have appeared in 1963, illustrates over a further hundred iron tools.

The great majority of the iron artifacts from the Philippines are points or blades and are usually tanged instead of socketed. Of the 35 tools previously illustrated two are definitely socketed and one more is possibly socketed (Beyer and de Veyra, 1947; 35 in 104 far right specimen; Fox, 1959*b*: pl. 164 top; Fox, 1959*a*: pl. 29 centre). From the illustrations, all three appear to have been cast flat and the socket hammered. The one illustrated by Beyer is from Novaliches, dating very early in the Christian era, while the other two are from Batangas of about the 14th and 15th centuries.

Only three iron tools among the one hundred odd ones from Central Philippines are socketed and one of these is probably a Spanish pikehead. The other two appear to have been cast with the socket (Solheim, n.d.: pl. 47*m* and 49*a*).

Sieveking's paper and illustrations (1962) indicate that, with one exception, the iron artifacts of Malaya are socketed and probably cast with sockets (*ibid.:* 96). The exception to the common variety is a group of four tanged knives from Batu Kurau, Perak (*ibid.:* pl. 16*d*–*e*). All four of these have an angle between the blade and tang.

The two iron blades pictured by Malleret (1960: pl. xviii top left) from the Mekong delta are both tanged at an angle to the blade. They differ from the Perak blades: having a small angular projection at the outer angle between the blade and tang. None of the iron blades previously illustrated from the Philippines have this angle, but several illustrated from Central Philippines (Solheim, n.d.: pl. 12*e* and 47*t*–*v*) are of this general type.

Malleret features only two other iron fragments from the Mekong delta. One is a portion of a long tang or stem while the other is a gouge or chisel with a pointed butt (1960: pl. xviii top right). A type of tool like this was recovered from the surface of a cave site in Batungan Mountain, Masbate, Philippines (Solheim 1953: 59), and several were recovered from other sites in Central Philippines (Solheim, n.d.: pl. 48*b*–*d*).

The iron artifacts so far recovered in the Philippines show no relationship to the common type of iron tool from Malaya, excepting the tools from one site. The iron blades from Batu Kurau in Perak are similar to tools found in Central Philippines and the Mekong delta. The other type of iron tool recovered from the Mekong delta is also found in the Central Philippines. These specific iron tools from these three areas are related, but it is too early to tell how.

Two bronze artifacts from Cebu, Philippines

Two bronze artifacts, now in the Museum of Anthropology, University of Michigan, were recovered by Guthe from a cave in Cebu, high up in the face of a cliff near Camp 8 on the Cebu-Toledo Road. Associated with the two artifacts was fragmentary human skeletal material including skull, lower jaw and leg bone.

The first tool is a simple celt (C8–2; Pl. I*b* and fig. 1) with the socket somewhat rectangular in cross section. A pair of parallel lines in low relief is noticeable on one

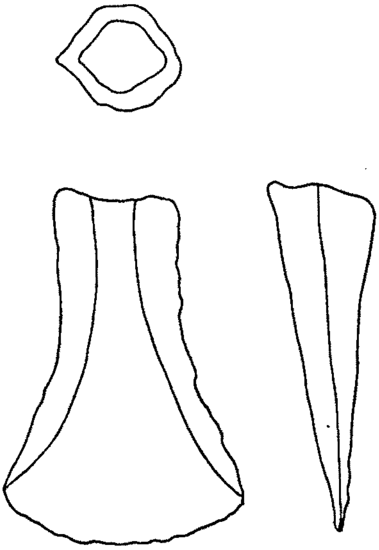

FIG. 1. Plan and cross sections of celt C8–2 from Cebu (½ size; C8 is the Guthe field-catalogue number).

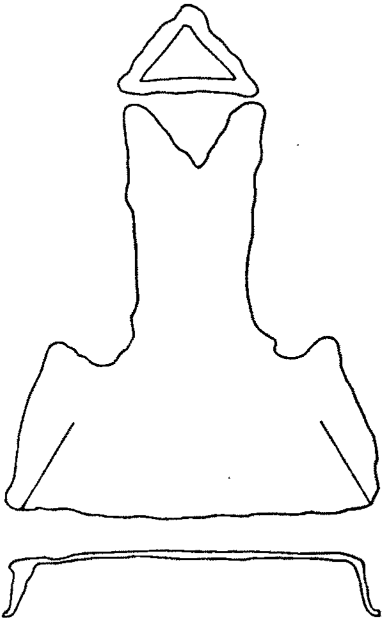

FIG. 2. Plan and cross sections of artifact C8–3 from Cebu (½ size).

face. Spectrographic analysis was made of the two tools but the film for this tool was not clear and the specimen was not rerun.

The second tool which is more complicated might be a spade (C8-3; Pl. II and fig. 2). The socket is triangular in cross section and there are raised wings at either side of the blade with distinct angles between the surface of the blade and the wings. From spectrographic analysis this tool contained major percentages of copper and tin, small amounts of calcium, silicon, and titanium, and traces of aluminium, silver, iron, manganese, and lead. There is a decoration in low relief running along two sides of the triangular socket and curving out on to the back portion of the blade (Pl. II*a* and fig. 3).

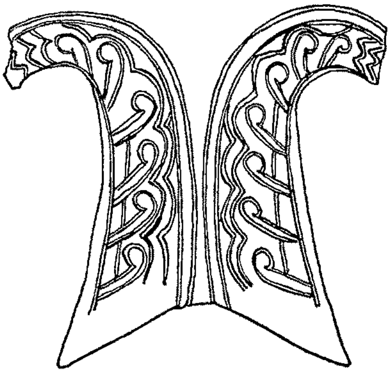

FIG. 3. Sketch of low relief design on artifact C8–3, made by Miss Evelyne H. Lawrence of the University of Michigan.

The design on this artifact is similar to designs found on Dongson bronze drums. However, the presence of only a trace of lead in the metal would tend to dissociate it from the Dongson bronzes. I have seen no other artifact at all similar to this one, so if any reader knows of anything like it, I should greatly appreciate hearing from him.

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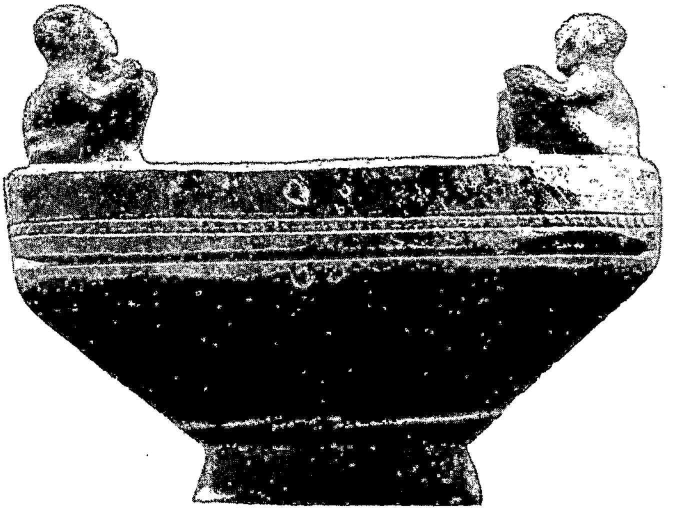
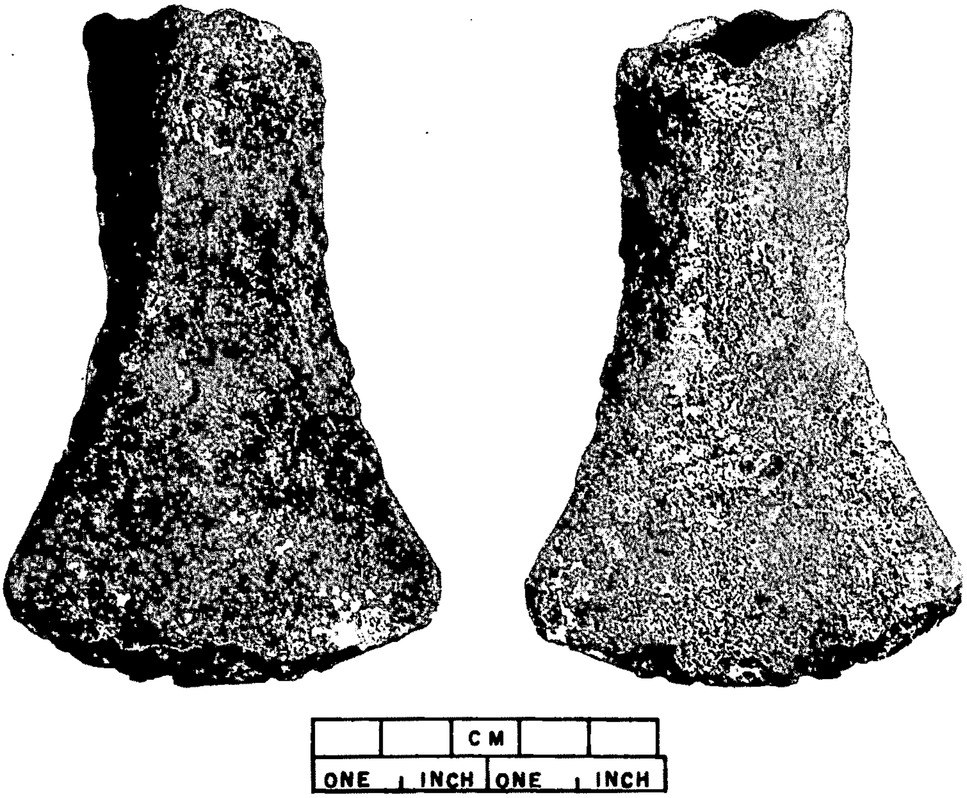
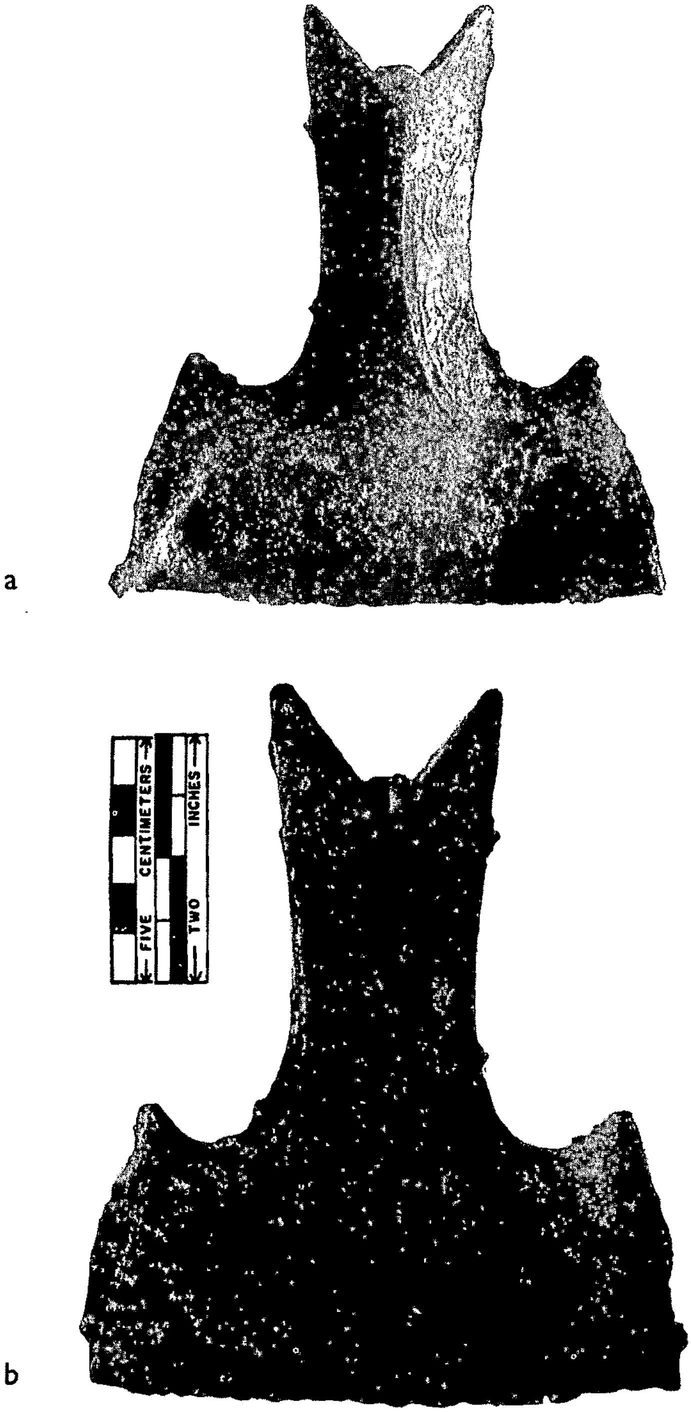


a. Carved sacred wooden box from Mountain Province, Philippines.



b. Bronze celt from Cebu.



Cast bronze artifact from Cebu.

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4

A Decade of Prehistoric and Protohistoric Archæology in India, 1951-1960

B. B. LAL

INTRODUCTION

That the *Asian Perspectives* has decided to include within its compass the countries of India, Pakistan and Ceylon is welcome news, and its Editor, Professor Wilhelm G. Solheim II, deserves to be congratulated on his breadth of vision, for there is no gainsaying that archæological discoveries in these countries not unoften have a bearing on their counterparts in the land segregated as 'Far East'. Indeed, is not the influence of Buddhism on various cultural aspects—metaphysical as well as material—of the life of the people in eastern Asia a matter of common knowledge? Or, is not a visitor to the temples at Angkor reminded of their Hindu prototypes in India? Though no doubt less known, yet in no way less significant, are the similarities between the Early Stone Age 'chopper-chopping' tools (Fig. 2) or the (? Neolithic) shouldered axes (Fig. 6) from India and their counterparts in eastern Asia. In the case of the shouldered axes, for all one knows, the influence might have travelled in the reverse direction, from eastern Asia to India. Thus, it is hoped that other readers too of the *Asian Perspectives* will regard this Indo-Pak-Ceylon 'intrusion' as a not unwelcome event.

Elsewhere in this issue is a summary of the archæological work done in India during the year 1961–62; and it is understood that relevant issues in future will also be having similar yearly reviews. Thus, in order that the readers may grasp the significance of these yearly discoveries and place them in the right perspective, it is felt that a résumé, of necessity very general in nature, of the recent developments in the prehistoric and protohistoric archæology of the country may be placed before them. And the present note is the outcome, covering the decade 1951–60.

Before, however, getting down to the résumé itself, it would perhaps be worth while to let the readers know something about the organization of archæological activities in India. The Constitution of India (adopted in 1950) permits the Central Government as well as individual State Governments to deal with the subject, their respective spheres, however, being duly defined. Thus, for obvious reasons, the biggest archæological organization in the country is that of the Central Government, viz. the Archæological Survey of India, which has ten Circles and six specialized Branches spread over the country. Most of the State Governments too have by now their own Departments of Archæology; the more active amongst them, however, are those of Andhra Pradesh, Gujarat, Madhya Pradesh, Maharashtra, Mysore, Rajasthan and West Bengal. The Governmental output is greatly supplemented, mainly on the research and excavation side, by that of universities and research institutes, the more noteworthy of them being the Universities of Allahabad, Banaras, Baroda, Calcutta, Madras, Patna and Saugor, and Deccan College

Post-graduate and Research Institute, Poona, and K. P. Jayaswal Research Institute, Patna. Thus, what is summarized below is not the produce of any single organization but the combined result of the efforts of all the above-mentioned organizations and the individuals behind them. However, for want of space as well as to avoid bothering our readers, most of whom are likely to be new initiates to Indian archæology, it is proposed not to burden this short narrative with names of individuals and organizations, and all concerned are requested to forgive the author for the omission.

THE STONE AGE

To begin with the Early Stone Age. In India, two major industries of this Age have been recognized: the 'Madrasian' of the south, characterized by bifacial

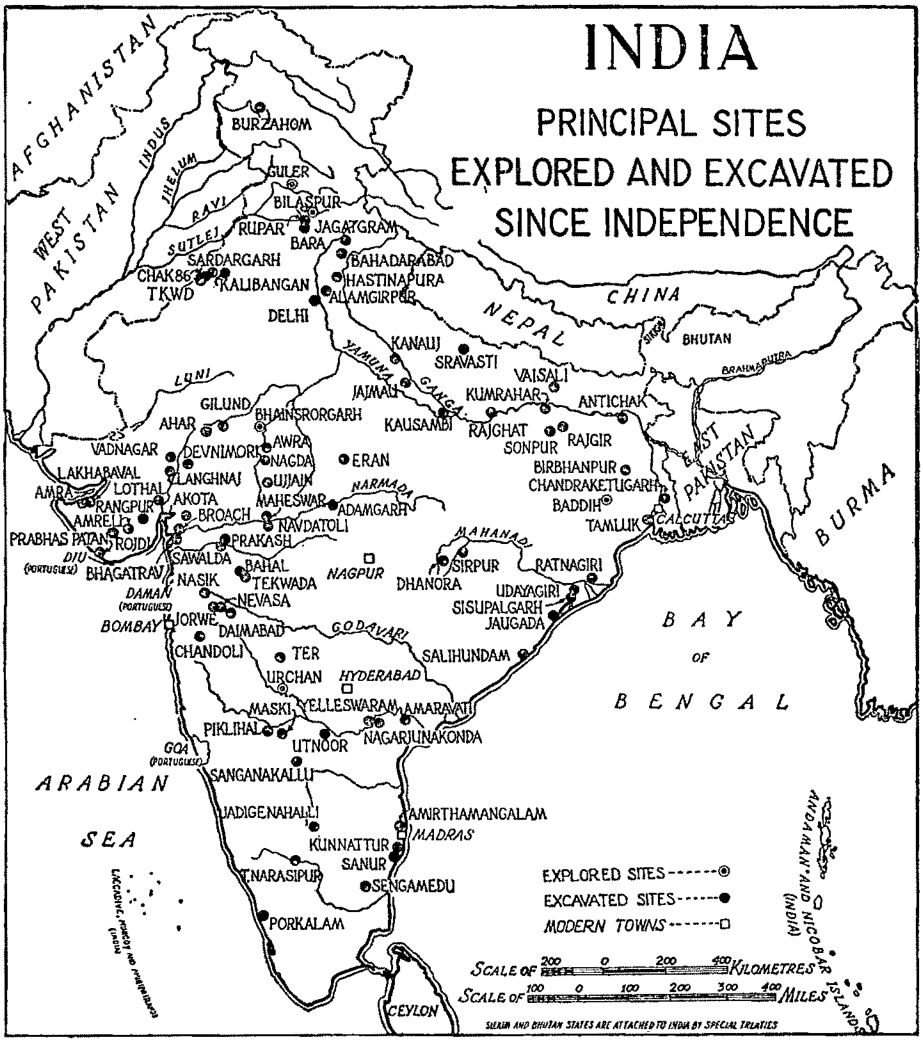

FIG. 1. India (1961). Principal sites explored and excavated since Independence.

hand-axes, cleavers, etc., and the 'Sohan' of the north-west dominated by unifacial 'choppers'. With the Partition (1947), almost all the sites of the latter category passed on to Pakistan. This set Indian prehistorians hard on the job and within hardly a decade they discovered several sites of this culture—e.g. Bilaspur, Daulatpur, Dehra, Guler, Nalagarh, etc.—in the sub-Himalayan foot-hills of Panjab (Fig. 1). As already stated, the most dominant tool-type of this culture is the unifacial 'chopper' (Fig. 2), although bifacial 'chopping-tools', cores and flakes, including

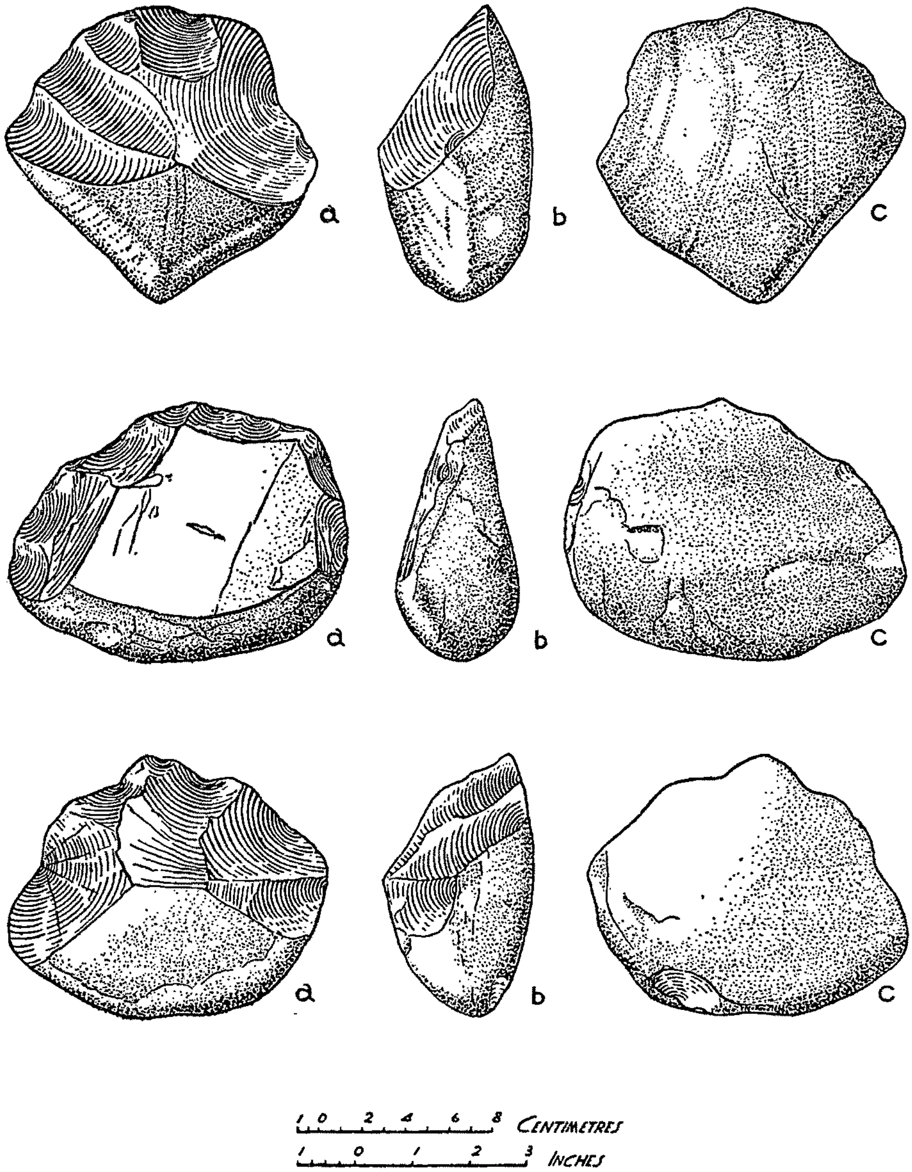

FIG. 2. Guler: Unifacial 'choppers'.

Levalloisian examples, are not wanting. Significant, however, is the absence from these newly-discovered sites of the bifacial cleaver and hand-axe.* One wonders, therefore, if a re-appraisal of the 'Sohan' culture is really not called for, as varying views are held by scholars regarding the constituents of this culture. Or, if it is not possible just now to re-survey the Sohan sites, it may perhaps be worth while, as an interim arrangement, to regard this now-identified Early Stone Age culture of the sub-Himalyan region as a separate entity, labelling it, say, 'Gulerian', from Guler where not only has a number of tools been found but well-defined terraces have also been observed.

In regard to the 'Madrasian' culture, not only has many a new site been discovered in already known regions but in certain cases new grounds have also been broken. The more noteworthy are the explorations in the districts of: Mirzapur in Uttar Pradesh; Monghyr and Singhbum in Bihar; Bankura in West Bengal; Keonjhar, Mayurbhanj, Sambhalpur and Sundergarh in Orissa; Guntur and Kurnool in Andhra Pradesh; Belgaum, Dharwar and Tumkur in Mysore; Ahmadnagar, Bombay, Chanda, Nasik, Satara and West Khandesh in Maharashtra; Ahmadabad, Mehsana, etc., in Gujarat; Damoh, Hoshangabad, Mandasor, Narsinghpur and Nimar in Madhya Pradesh; and Bhilwara, Chitorgarh, etc., in Rajasthan.

But the most important work in the realm of the Stone Age, during the decade under review, relates to tools which have been labelled variously as of Series II, Upper Palæolithic or of Middle Stone Age. Although tools of this category had no doubt been reported from a few places even previously, it is only the recent work which has placed them in a well-defined stratigraphic sequence, apart from bringing to light a very large number of sites yielding such tools—from Gujarat in the west to West Bengal in the east and from Rajasthan in the north to Mysore in the south. Made mostly on fine-grained stones like jasper, chert, chalcedony, etc.—in contrast to the usual quartzite of the Early Stone Age—the tools comprise points (in a few cases with an incipient tang), borers or awls, rarely an odd burin, and scrapers of all sorts—round, straight-sided, hollow or notched, convex, etc. (Fig. 3). At Maheswar in Madhya Pradesh, as also at a few other sites elsewhere, the tools have been collected from deposits which are definitely later than the ones yielding the Early Stone Age tools. At Nevasa and Kalegaon, both in district Ahmadnagar, Maharashtra, the tools have been found in association with the remains of *Bos Namadicus*, which lends to them a date within the Pleistocence, maybe in its last quarter.

The microlithic industries of India had been thought in the past, by many a writer on the subject, to belong to a relatively recent date and thus their 'mesolithic' character, in the widely-recognized sense of the term, had largly been doubted. In this connexion, the work at the *Teri* sites of South India, in Mirzapur district in Uttar Pradesh and at Birbhanpur in West Bengal has been most revealing. At the *Teris*, the microliths are associable with a sea-level suggestive of a period prior to

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* The two examples of bifacial hand-axes from Guler were pitted and rolled: the outlines no doubt answered to the general shape, but the flake-scars showing deliberate shaping were few and far between. The specimens had provisionally been listed in the hope that an eye might be kept open for the hand-axe in subsequent explorations of the area. Recent work in the Bilaspur region, however, has not brought in any bifacial hand-axe, not to speak of the cleaver.

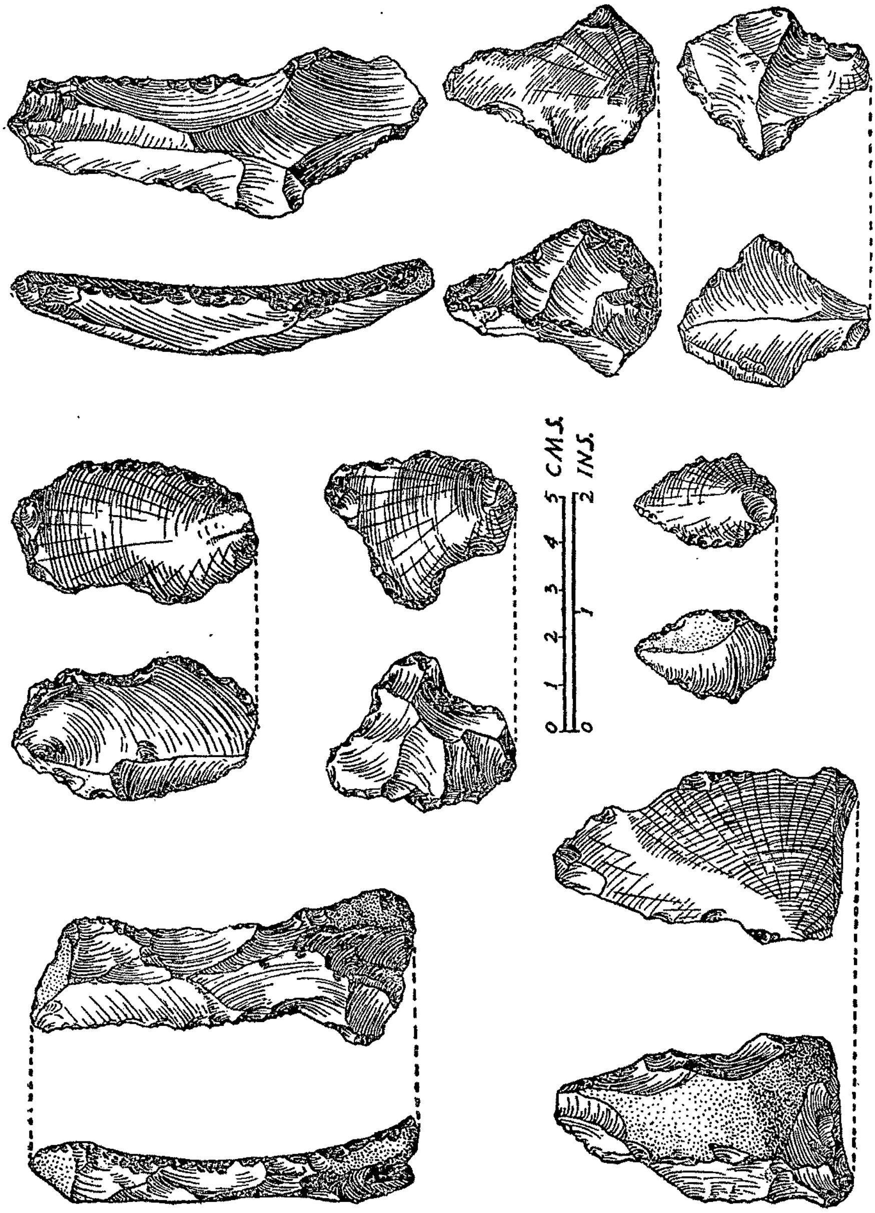

FIG. 3. Tapti valley: Middle Stone Age tools.

4000 B.C. At Birbhanpur, their geological horizon (Fig. 4) may indicate an equally early, if not earlier, date. In all the three areas just mentioned, the tools are, by and large, non-geometric in character and devoid of any association with pottery. Microliths, incorporating the geometric element (e.g. the triangle and trapeze) and associated with pottery, have been found at Langhnaj and other associated sites in Gujarat and at Adamgarh in Madhya Pradesh. Thus, with these discoveries, there emerges an intelligible picture of the microlithic or Late Stone Age industries of India.

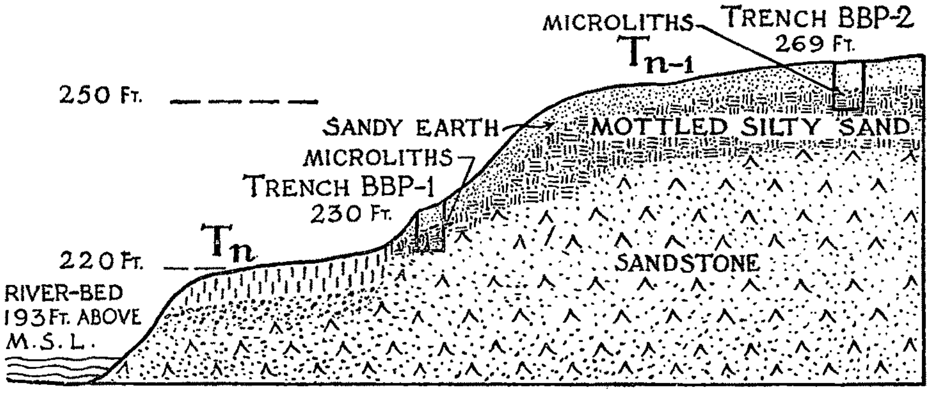

FIG. 4. Damodar terraces near Birbhanpur. Schematic section.

THE PROTOHISTORIC PERIOD

Passing out of the Stone Age, one comes to what is known as the 'Protohistoric' period, regarded as ending, by some, with the times of the Buddha (sixth century B.C.) or, by others, with the invasion of Alexander the Great (326 B.C.). Indeed, the period between, say, the middle of the fourth millennium B.C. and the middle of the first millennium B.C. is *the* period during which was born and nurtured the ancient civilization of India. This synthesized civilization continued to flourish in India all through the historical times, there being only minor additions and modifications with the coming in of the Muslims and the Europeans.

Unfortunately, we do not yet have a clear picture of exactly how man on the Indo-Pakistan subcontinent passed from the food-collecting stage on to that of agriculture and domestication of animals. In the north-west, various early village-cultures, each spreading over a limited time and space, have been identified, but the story is really far from complete.

About the middle of the third millennium B.C., one finds in the valleys of Indus and its tributaries a full-fledged urban civilization known as the Indus civilization, or sometimes as the Harappa culture, from the site where it was first identified. In the 1920s two major sites of this civilization—Harappa and Mohenjo-daro—had been excavated, but as a result of the Partition they passed on Pakistan. On the day of the Partition, in fact, only two known sites, both minor settlements—Kotla Nihang in Panjab and Rangpur in Gujarat—were left in India. But an enthusiatic band of field archæologists has by now put more than a hundred sites of the Harappa culture on the Indian map. Of these, four call for special attention: Kalibangan in Rajasthan, Rupar in Panjab, Alamgirpur in Uttar Pradesh and Lothal in Gujarat (Fig. 1).

The site of Kalibangan consists of two mounds, a bigger one on the east and a smaller one on the west. While the eastern mound has yielded regular house plans, with east-west and north-south orientation of the streets, the one on the west seems to suggest the existence of a citadel.* If this be so, Kalibangan would appear to follow the general lay-out of the cities of Harappa and Mohenjo-daro, and, on their analogy, may be regarded as a provincial capital of the Indus civilization.

From the lower levels of the site also comes some pottery (Pl. I*a*) which points to an antecedent culture, the details of which, however, have yet to be gathered.

Amongst the finds from Kalibangan, particular attention may be drawn to certain inscribed potsherds (Pl. I*b*); the overlap of their symbols clearly shows that the direction of writing was from the right to the left—indeed a positive step in the tackling of the yet undeciphered Harappan script.

Rupar is to be noted for its stratigraphical sequence (Fig. 5). There are six periods of occupation, yielding, from bottom upwards, the remains of: I, the Harappa culture (here dating perhaps to the first quarter of the second millennium B.C.); II, Painted Grey Ware culture (first half of the first millennium B.C., see below, p. 152); III and IV, early historical cultures, beginning with the Northern Black Polished Ware (*c.* fifth century B.C.) and ending in the late Gupta remains (*c.* sixth century A.D.); and V and VI, Medieval times (respectively *c.* A.D. 800–1000 and *c.* A.D. 1300–1700). Here it was that the Pained Grey Ware was observed, in a well-stratified sequence, to overlie the Harappan remains.

Alamgirpur, on the bank of the Hindan, a tributary of the Yamuna, in Meerut district of Uttar Pradesh, is the easternmost site known so far of the Harappa culture. The discovery serves not only to show that this culture extended for over 1,500 kilometres across the northern part of the Indo-Pakistan subcontinent but also to emphasize the point that the 'Indus' civilization was indeed trans-Indus and had actually penetrated into the upper regions of the Ganga-Yamuna valley.

Lothal, not very far from the Gulf of Cambay, an inlet of the Arabian Sea, has yielded evidence of a dockyard, made of kiln-burnt bricks and measuring 218 by 37 metres (Pl. I*c*). Boats, big enough for coastal trade, seem to have sailed from the Gulf up the river Bhogavo, with which the dockyard was evidently connected by a 7-metre wide channel (identified in the excavation only to some length). That indeed there did operate an overseas trade from Lothal is fully borne out by the discovery at the site of a seal of steatite (Pl. II*a*), which is of a type at home at Bahrain and other sites on the Persian Gulf. The Lothal seal may thus be registered as the 'lost property' of one of those engaged on a trade between Iraq and India in the last quarter of the third millennium B.C. Do not the concerned Sumerian documents also seem to point to such a trade?

In the 1940s, the period between the end of the Indus civilization and the invasion of Alexander the Great was regarded as the veritable Dark Age of Indian Proto-history, with hardly an odd flicker here and there, for example the stray finds of

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* The work is still (1963) on and the final position will be known in a couple of years.

'Copper Hoards' in the north or the polished stone axes or megaliths in the south. But none of these gave any definite bearing. The work at Brahmagiri in 1947 put the two south Indian cultures just mentioned in some stratigraphic order, but north India continued to remain 'dark' until an extensive search brought to light the Painted Grey Ware (Pl. II*b*) from a large number of sites in the Ganga, Yamuna and Sarasvati valleys. The exploration was followed, during 1950–52, by an excavation at Hastinapura on the bank of the Ganga in district Meerut, Uttar Pradesh,

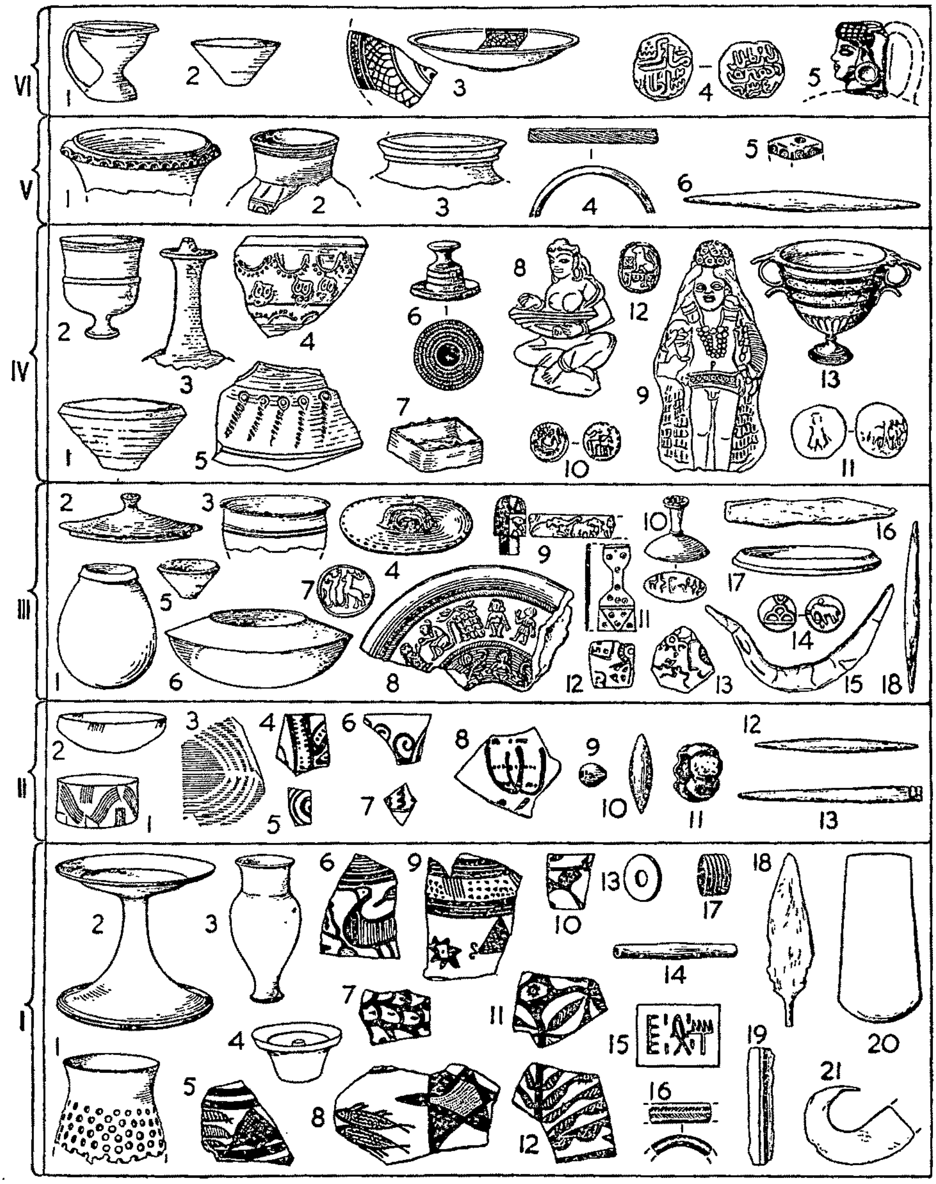

FIG. 5. Rupar: Culture sequence.

which, according to the Indian epic *Mahābhārata* was the capital of the Pandavas. Five cultural periods were identified, the earliest, I, yielding a red ochrous ware which is surmised on some circumstantial evidence to be associated with the 'Copper Hoards'. Subsequent work at Bahadarabad, further up the Ganga, also pointed to the same direction, but conclusive proof, may it be added, is still to be had. Further, it has also to be worked out if and what relationship the copper hoard-*cum*-Ochrous Ware culture bears with the Harappa culture itself.

Period II of Hastinapura was characterized by the Painted Grey Ware. The inhabitants were in a rural stage of economy: they lived in houses of mud or wattle-and-daub, carried on agriculture and kept domesticated animals, amongst which particular mention may be made of the horse. To begin with, they seem to have used only copper but a little later they wielded iron as well. A great flood in the Ganga washed away a major portion of the Painted Grey Ware settlement at Hastinapura (Pl. II*c*); and, as it is, the archæological findings seem circumstantially to confirm the literary evidence that after the washing away of Hastinapura by the Ganga the capital was shifted to Kausambi (below, p. 156).

Period III of Hastinapura, characterized by the Northern Black Polished Ware, is assignable, in very broad terms, to the second half of the first millennium B.C. The preceding culture, viz. that associated with the Painted Grey Ware, may, therefore, be placed in the first half of that millennium, with a probable intrusion into the second millennium B.C.

The gap, thus, has been narrowed, but there is still another half-a-millennium or so to cover. The work is on, and the goal not altogether out of sight!

In northern India, another significant discovery has been registered during the decade under review. It relates to a culture designated as the Ahar or Banas culture and characterized by a white-painted black-and-red ware. Broadly, this culture is assignable to the second quarter of the second millennium B.C., and may have co-existed with the Harappa culture during latter's fag end.

So far as protohistory is concerned, central India and northern Deccan were practically *terra incognita* prior to the fifties. Extensive work during the decade, however, has shown that there did exist regular settlements of chalcolithic people in the various river valleys of the region, some of them going as far back as the first quarter of the second millennium B.C. Amongst the more important sites of this chalcolithic complex, mention may be made of: Navdatoli, Nagda, Eran, and Tripuri in Madhya Pradesh, and Prakash, Bahal, Nasik, Jorwe, Nevasa, Daimabad and Chandoli in Maharashtra (Fig. 1). Though much work still remains to be done, on the present showing these sites may be divided into two broad groups, one covering the Narmada, Chambal and allied valleys of central India and the other having the upper Godavari valley as the focus. Navdatoli and Jorwe respectively may provisionally be regarded as the type-sites of the respective groups.

At Navdatoli, the culture is characterized by, besides microlithic blades of chalcedony, agate, etc., and flat axes, fishhooks, pins and rings of copper, a typical black-on-red pottery called the Malwa Ware, two of the more distinctive shapes in it being the channel-spouted bowl and the stemmed chalice (Pl. III*a*). The inhabitants lived in oblong or circular huts made by the plastering up with mud of a framework of wooden post-*cum*-bamboo screen. The principal occupations of the people seem to have been agriculture, domestication and hunting of animals and fishing. Amongst the cultivated cereals, special mention must be made of the rice, being the earliest (sixteenth century B.C.) definite example so far discovered in India.

Basing his arguments on the similarity of certain pot forms, particularly, the channel-spouted bowl, with their possible counterparts in Iran, the excavator is inclined to think that the central Indian chalcolithic culture is of Iranian import. He is further inclined to see the Aryans in the bearers of this culture. However, before ideas get hardened, two other approaches to the issue should not be overlooked altogether. At Lothal, one comes across a transmutation of the Harappa culture itself, which process is further continued at a neighbouring site called Rangpur. But whether and how far these survivals of the Harappa culture actually contributed to the make-up of the central Indian chalcolithic culture are matters for future research to decide. The other approach would be to find out as to what happened to the central Indian microlithic people whose traces are met with at many a place in that region. As regards the equation of the central Indian chalcolithic people with the Aryans, it must not be forgotten that the horse, a prominent animal in the Vedic literature, has not so far been reported from any of the sites of the culture.

The Upper Godavari or better say the northern Deccan chalcolithic culture, later than the central Indian one by about three centuries, is marked by a matt-surfaced, black-on-red ware, called the Jorwe Ware, the more prominent types being the carinated bowl and vase with tubular spout (Pl. III*b*). There are two other noteworthy cultural traits which distinguish it from its central Indian counterpart, viz. pot burials (Pl. III*c*) and polished stone axes. These traits were perhaps derived by the northern Deccan chalcolithic culture from a late phase of the southern Neolithic culture, the latter receiving in return not only the black-on-red pottery but perhaps also the copper element (below). A particularly noteworthy discovery in the context of the northern Deccan chalcolithic culture is that of a thread of silk with which were strung the beads of a necklace bedecking a dead at Nevasa. This is the earliest (13th century B.C.) example of silk so far found in the country.

To come to South India. It has already been stated that the excavation at Brahmagiri in 1947 had placed the two major cultures of the pre-Christian era, viz. the Polished Stone Axe culture (called here the southern Neolithic culture) and the Megalithic culture in their proper stratigraphical context. The clues were immediately followed up at Sanganakallu and later on, during the decade under review, at Utnur and Nagarjunakonda in Andhra Pradesh and Piklihal, Maski and T. Narasipur in Mysore State. As a result of these excavations, two phases of the southern Neolithic culture seem to be recognizable: an earlier one, which may be regarded as 'true neolithic', characterized by burnished grey and buffish-grey wares, extended and urn-burials and polished stone axes; and a later one, in which the black-on-red ware and copper implements also make their appearance. In respect of the earlier phase, the excavation at Utnur is singularly enlightening. In the first place, it has demonstrated that the 'ash mounds', which have been the subject-matter of a controversy in recent years, are, in all likelihood, cattle pens (*cf.* Pl. IV*a*). Secondly, a charcoal sample from the site has given the Carbon-14 determination as 4120 ± 150 B.P., showing that South India was inhabited by these neolithic people roughly at a time when the Harappans occupied the north-west. Indeed, there is no longer any justification for keeping the map of South India a blank late in the third millennium B.C.

In regard to the Megalithic culture, much welcome light has been thrown in recent years by the excavations at: Sanur, Kunnattur, Amrithamangalam and Sengamedu in Madras State; Jadigenahalli and T. Narasipur in Mysore State; Porkalam in Kerala; and Nagarjunakonda, Yelleshwaram and Maski in Andhra Pradesh. Usually, fractional burial and lithic appendage of one kind or another are regarded as essential features of the Megalithic complex, in addition, of course, to the Black-and-red Ware. The excavation at Maski, however, has shown the existence of all the possible variations, viz. fractional burial with the lithic element or without it, and full burial, again, with the lithic element (Pl. IV*c*) or without it. This might indicate that Maski stands perhaps at a transitional stage. Thus, as recent discoveries have demonstrated a high antiquity for the black-and-red ware technique in India, e.g. at Ahar and Lothal, it would be worth while to probe systematically into the moorings of the Megalithic culture itself.

Two more areas must be referred to, even though the résumé has got to be brief. One is eastern India, and the other the valley of Kashmir in the extreme north-west.

In eastern India, sites like Tamluk, Sisupalgarh, Jaugadha, etc. give a reasonable picture of the early historical times. But the picture prior to this period and after the Late Stone Age is rather hazy. Ascribable to this intervening period, at the moment, are two vaguely defined cultures: one characterized by polished stone axes with oblong cross-section (Fig. 6) and a coarse brown ware; and the other indicated by the stray finds of copper or bronze axes. There might fall within this period a few other elements too, and it is but meet to emphasize the need for a more systematic work on the protohistory of this area.

To turn to Kashmir. At Burzahom, not far from Srinagar, De Terra had noted, some three decades ago, a complex of huge stones vaguely resembling megalithic menhirs. In a trial excavation at the site, he had also discovered polished stone axes and grey and black wares. As, however, the picture was far from clear and as, during the intervening period, fanciful theories about the identity of the two wares had begun to grow—the grey one being equated with the grey ware of a post-Harappan culture identified at Jhukar in Pakistan and the black ware with the well-known Northern Black Polished Ware, it was thought worth while to excavate the site once again, on a large scale. Accordingly, work was commenced over here in 1960 and is still (1963) in progress.

The excavation has revealed that the earliest inhabitants of Burzahom were essentially in a neolithic stage, using polished stone axes and bone tools, the latter comprising harpoons, needles, chisels, etc. (Pl. IV*b*). The pottery was a burnished grey ware, often with mat-impressed designs on vase bases—incidentally, quite different from the Jhukar ware. But the most unusual thing about these people was that they dwelt in pits. Roughly circular on plan, the pits had a narrow mouth (1–2 metres in diameter), tapering sides and wide bottom (2–4 metres in diameter; Pl. V*b*). In depth, they ranged from 1·50 metres to 3 metres, there also being provision of landing steps in the deeper ones. The presence of post-holes along the mouth in certain cases suggests that some kind of a roofing was provided for. In the course

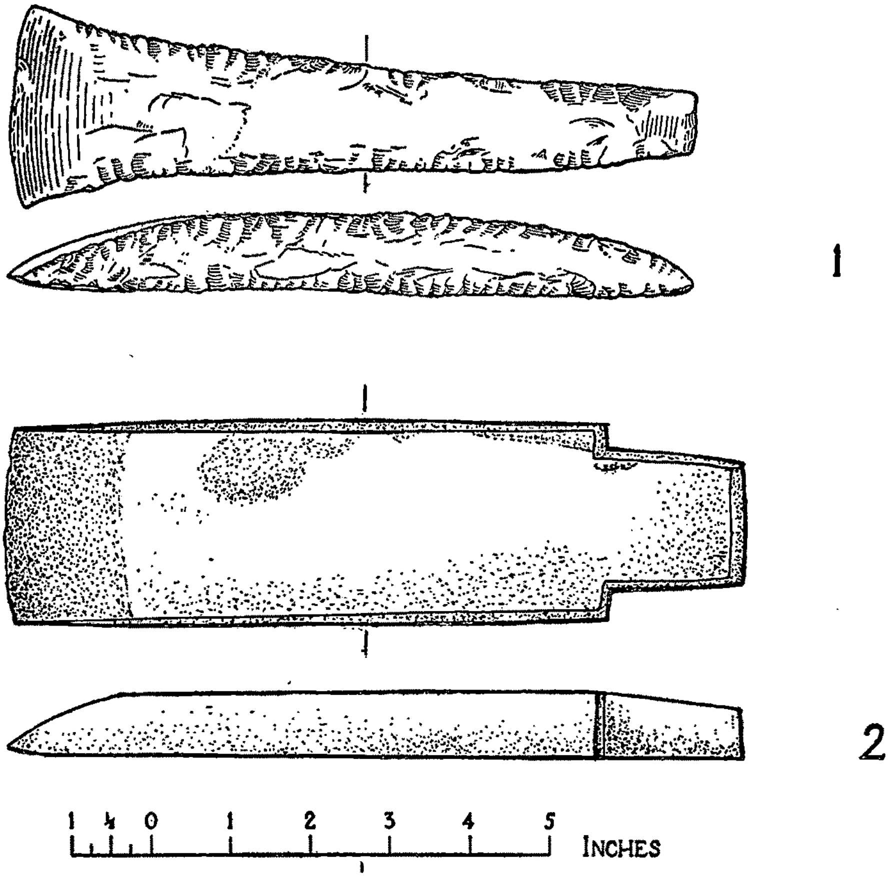

FIG. 6. 1, stone 'bar celt' from Ban Asuria, West Bengal, and 2, stone shouldered celt from Amsigada, Orissa.

of time, these pits gave way to mud and mud-brick houses, and a burnished black ware—quite different from the Northern Black Polished Ware (*cf.* above)—also came into being. Following this second phase was the one to which the menhirs may be ascribed. The fourth or latest phase at the site was, however, of the early historical times.

The discovery of this north-western Neolithic culture (as the earliest culture of Burzahom may provisionally be labelled) is indeed unique, particularly because of the bone tools. Outside the valley, no other site of this kind has so far been located in the country. Thus, for parallels we may have to look further to the north-west, beyond the confines of India.

COMING TO HISTORICAL ARCHÆOLOGY

Protohistory may be dull and dry if not tagged on to history and historical personages. Thus, in conclusion, attention may be drawn to the excavation of a few early historical sites of northern and central India: Vaisali in Bihar, Kausambi, Sravasti and Rajhgat in Uttar Pradesh and Ujjain in Madhya Pradesh. These were the capitals of the concerned *Mahājanapadas* (=Great Kingdoms) which flourished during the time of the Buddha. At the first-named site have been unearthed the remains of a *stūpa* (Pl. VI*b*) which, it is believed, was built by the Lichchhavis over their share of the relics of the Buddha. At Kausambi has been found an inscription bearing testimony, if such were needed, to the visit of the Buddha to the site. The visit, as we know from the literature, was at the request of Udayana, then the king of Kausambi, whose stone-built palace is also claimed to have been identified. The defences around the site are mighty—and mighty is really no exaggeration in this case, for even today the burnt-brick revetment may be seen shooting skywards to a height of over thirteen metres (Pl. V*a*). Defences have also been identified at the other sites, viz. Sravasti, Rajghat and Ujjain, the last-named site also yielding interesting evidence of an ironsmith's workshop (Pl. VI*a*).

SELECT BIBLIOGRAPHY

In consonance with the foregoing résumé the bibliography that follows has also got to be brief. Thus, only the more noteworthy publications during the decade are listed. Under the circumstances, authors whose publications do not find a mention here are requested kindly to pardon the present writer for the omission.

Secondly, as the bibliography lists publications only during the concerned period, it is just possible that it may not include references to all that is mentioned in the foregoing résumé. For, detailed reports on excavations and explorations are often published quite some time after the events, and newspapers and periodicals carrying interim notices may not be easily accessible abroad.

A third point also deserves to be mentioned. For the very reason that full reports on field work are published much later than the field work itself, it would so happen that some of the publications which appeared during the decade under review, and are, therefore, listed below, might refer to an earlier work not referred to at all in the résumé.

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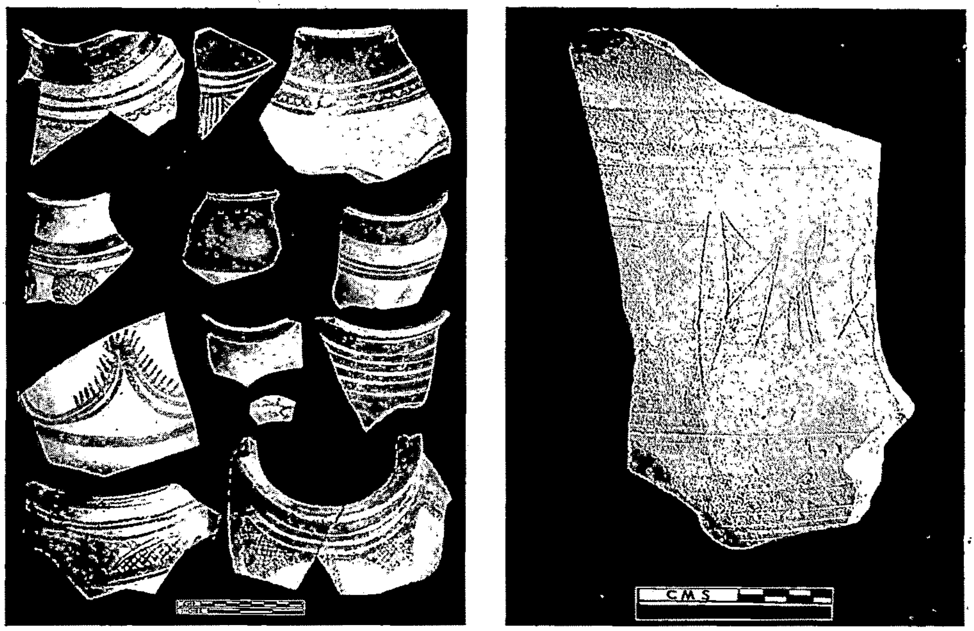
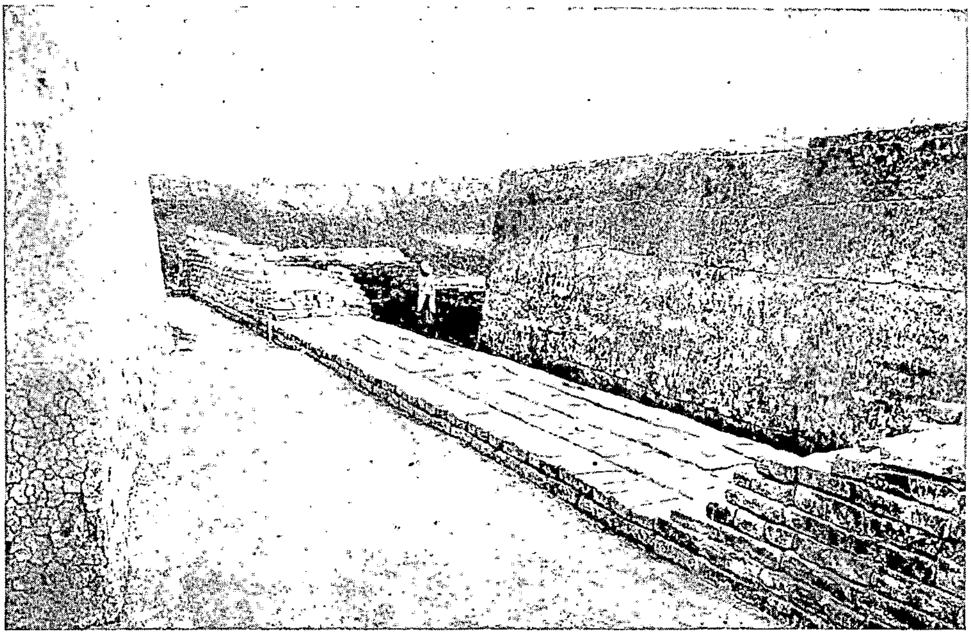


KALIBANGAN:

a. Pre-Harappan pottery (see p. 150) *b.* Inscribed potsherd from a Harappan level (see p. 150)



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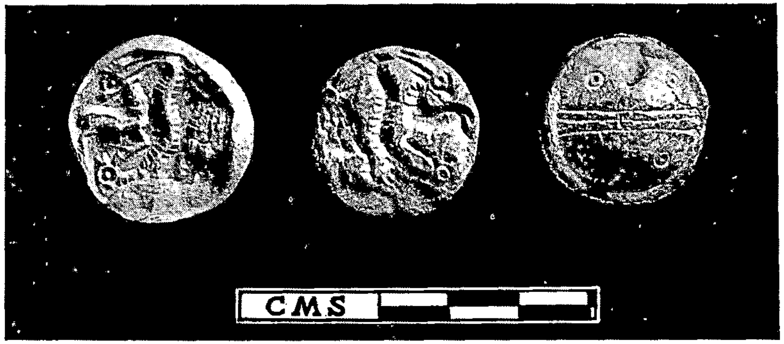
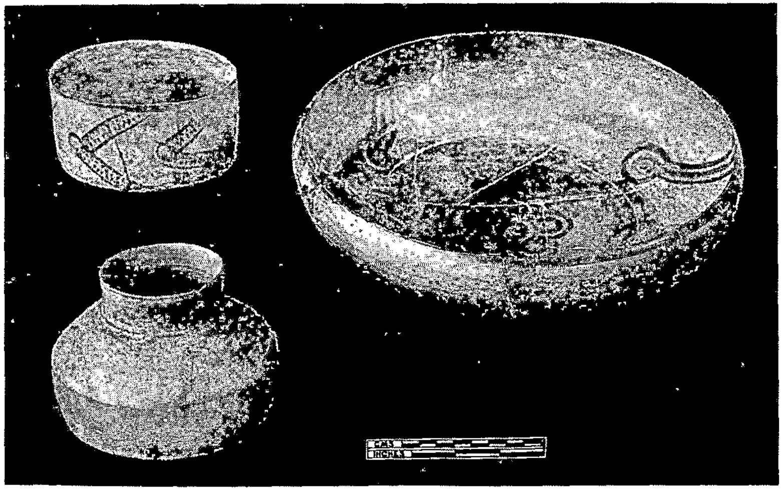
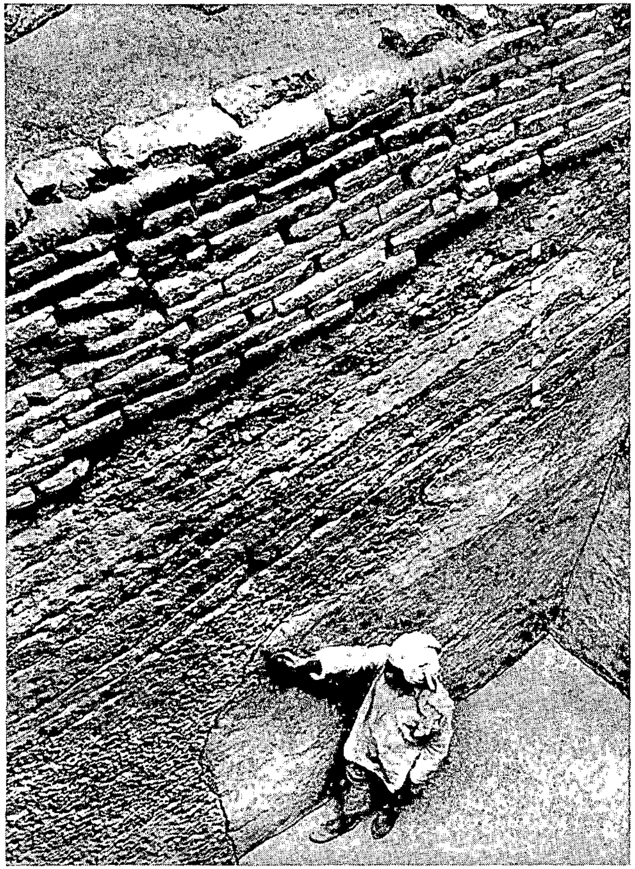
LOTHAL: *c.* Passage for boats in the dockyard embankment (see p. 150)



a. LOTHAL: 'Persian Gulf' seal (see p. 150)



b. RUPAR and AHICHCHHATRA: Painted Grey Ware (see p. 151)



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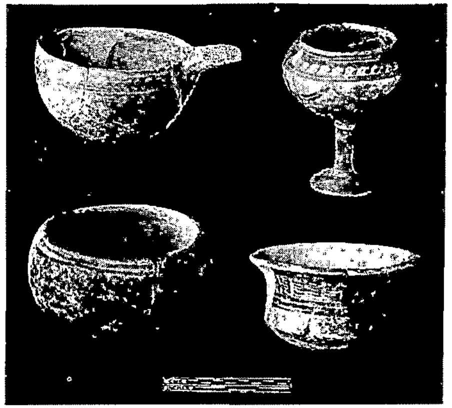
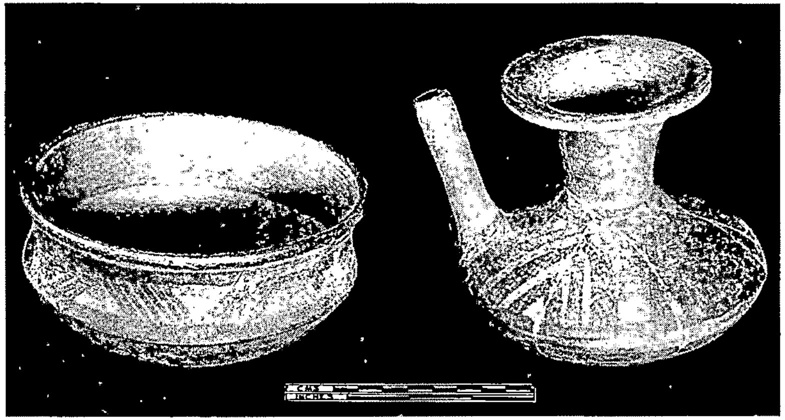
c. HASTINAPURA: Erosion scar made by the Ganga floods which devastated the Painted Grey Ware settlement (see p. 152)

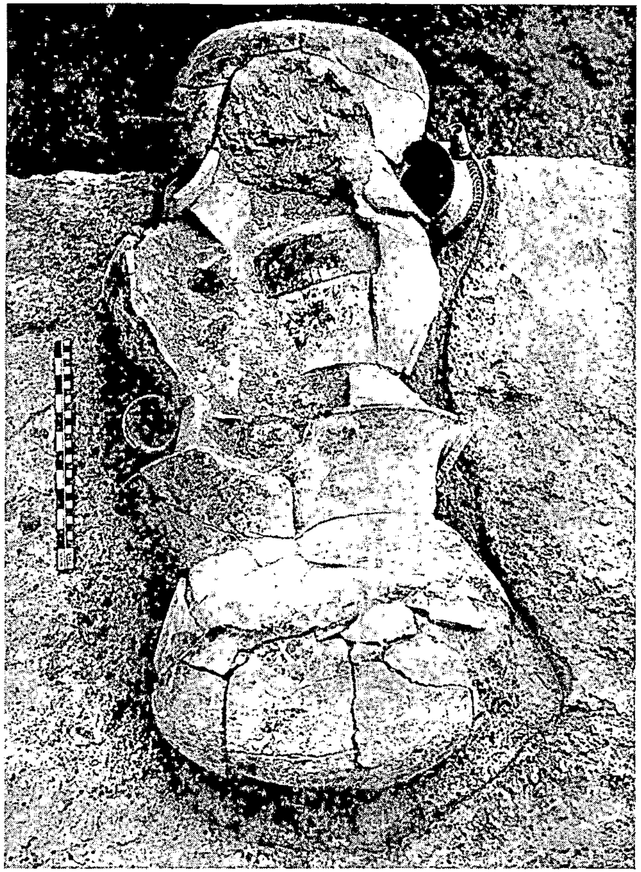


a. NAVDATOLI: Chalcolithic pottery (see p. 152)



Deccan College Post-graduate and Research Institute, Poona

b. NEVASA: Jorwe Ware (see p. 153)



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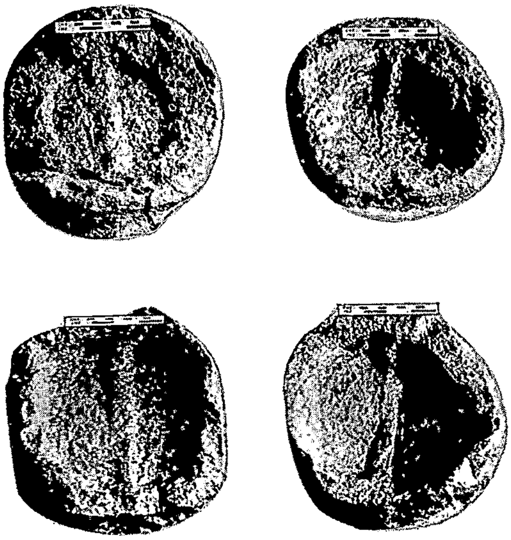
c. DAIMABAD: Urn burial (see p. 153)



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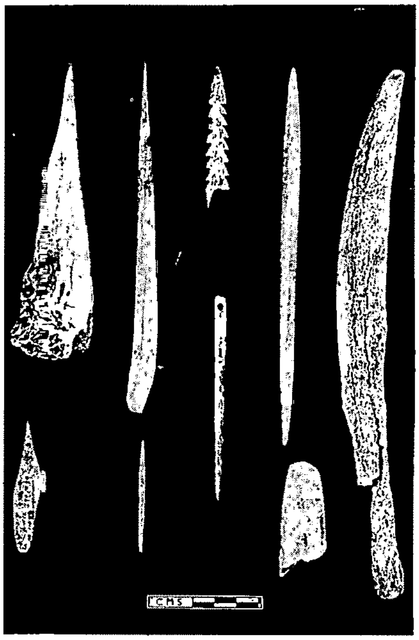
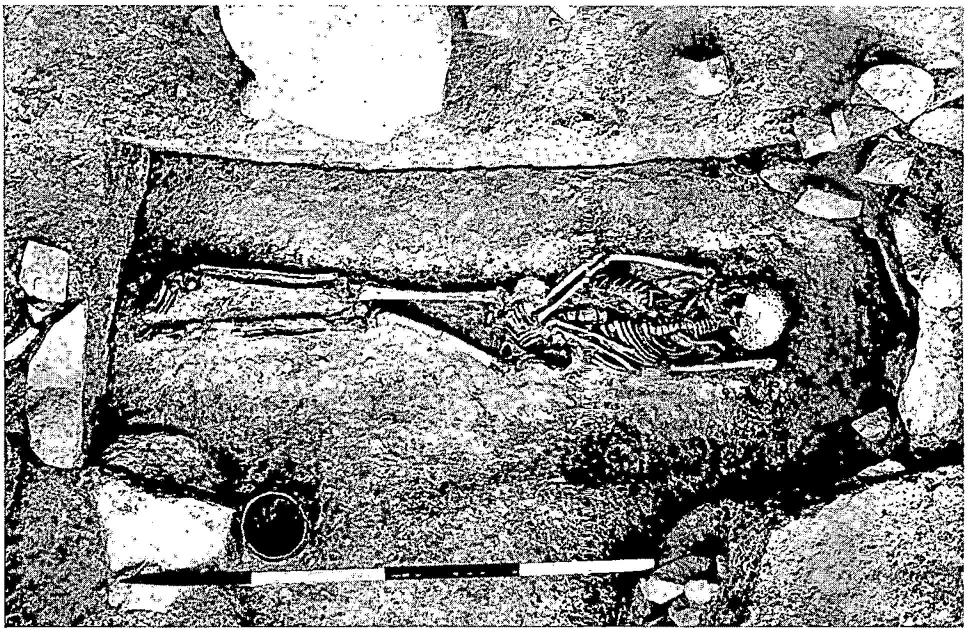
a. UTNUR: Hoof impressions, after lifting (see p. 153)



b. BURZAHOM: Bone tools (see p. 154)



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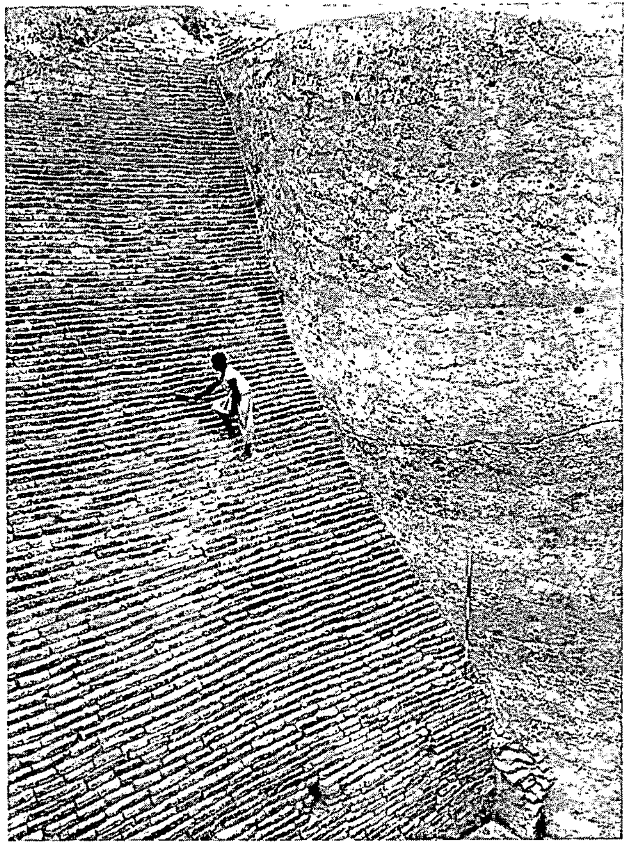
c. MASKI: Megalithic burial (see p. 154)



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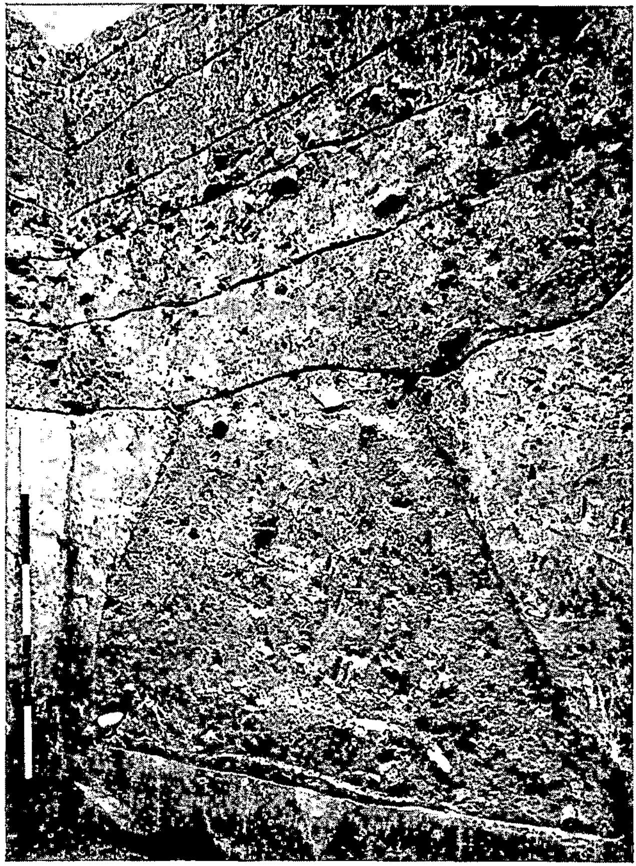
a. KAUSAMBI: Brick revetment of defences (see p. 156)



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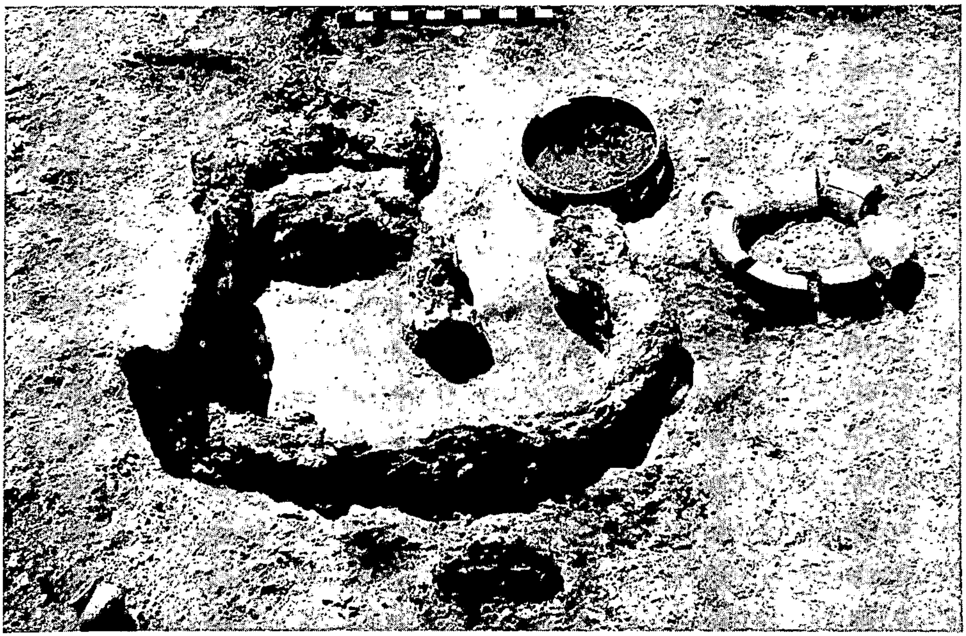
b. BURZAHOM: Dwelling pit (see p. 154)



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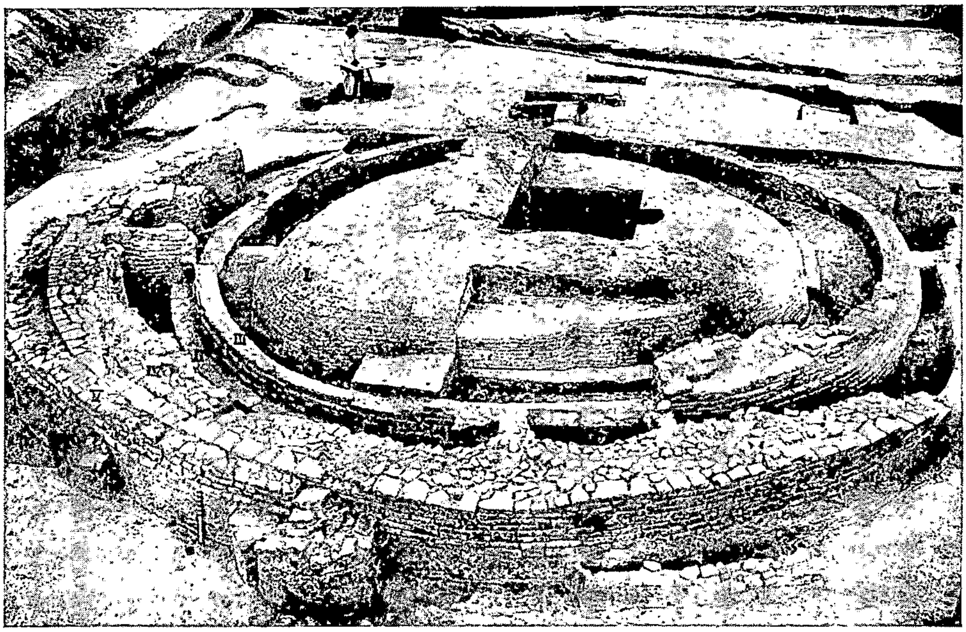
a. UJJAIN: Ironsmith's furnace (see p. 156)



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5

Recent Exploration for the Remains of Early Man in India

A. P. KHATRI

INTRODUCTION

This is a short account of the field work conducted by the writer during 1959-60 under a research scheme which was financed by the Council of Scientific and Industrial Research [CSIR] Government of India. Its object was to discover fossil man in India by making a thorough search of the caves, rock shelters, Pleistocene deposits and implementiferous cum fossiliferous sites known and unknown. The areas selected for this were in the Shiwalik foothills in the north, the Narmada valley in the middle and the Earamalai hills of Kurnool in the South—all were very well known for the wealth of fossils and stone age tools since a century or so (Map 1).

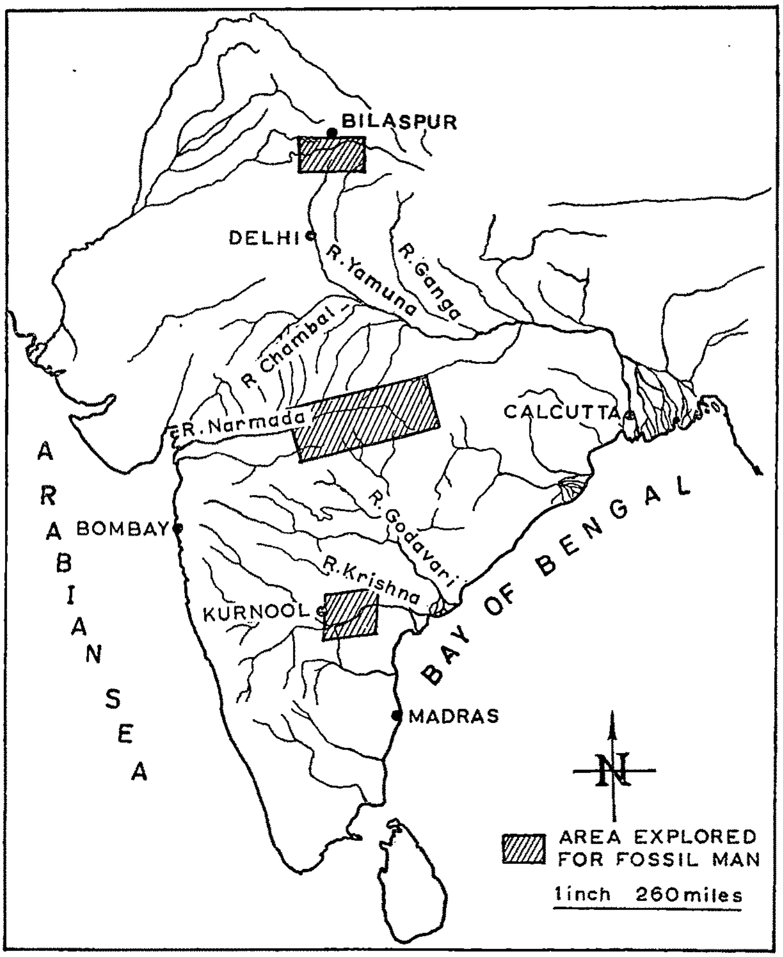
Though we did not find what we were searching for—fossil man's bones—the project had for effect to bring together for the first time in India, a geologist and a prehistorian archæologist. Dr D. N. Wadia, F.R.S., the Chairman of the Board of Geological Research of the CSIR, Dr M. R. Sahni, the President of Palæontological Society of India, and Dr H. D. Sankalia, the Director of the Deccan College Postgraduate and Research Institute, Poona, are to be congratulated for the scheme and obtaining its approval by the Council.

In our attempt, many important problems belonging to the domain of prehistoric archæology and Pleistocene stratigraphy were tackled, and very rich collections of fossils and implements were made. Their study will throw light on fossil man's culture and on the variety of mammalian fauna, contemporary with him. No homonid fossil remains were found.

THE SHIWALIKS

To students of human origins, the Shiwaliks are known for their remains of fossil primates, which made them known world-wide as one of the most important evolutionary centres of sub-human primates. The primate collection so far made from these foothills include some four genera and ten species of anthropoid apes ranging stratigraphically from the Middle Miocene to the Early Pleistocene. Unfortunately the primate remains so far discovered are very fragmentary and no definite conclusion can be drawn on their probable lines of descent and their relationship to the main trunk of human ancestry. Yet they provide us with the proof that there existed a vigorous and highly differentiated family of the anthropoid apes in an epoch when man is believed to emerge from his 'animal state'; and they suggest that Early Man may have existed in India and his fossil remains may eventually be discovered in these foothills of the Himalayas.

In all eight localities are mentioned in the record, from where primate finds have been obtained in the Shiwaliks. These are Chinji in Attock district (Lower Shiwaliks)

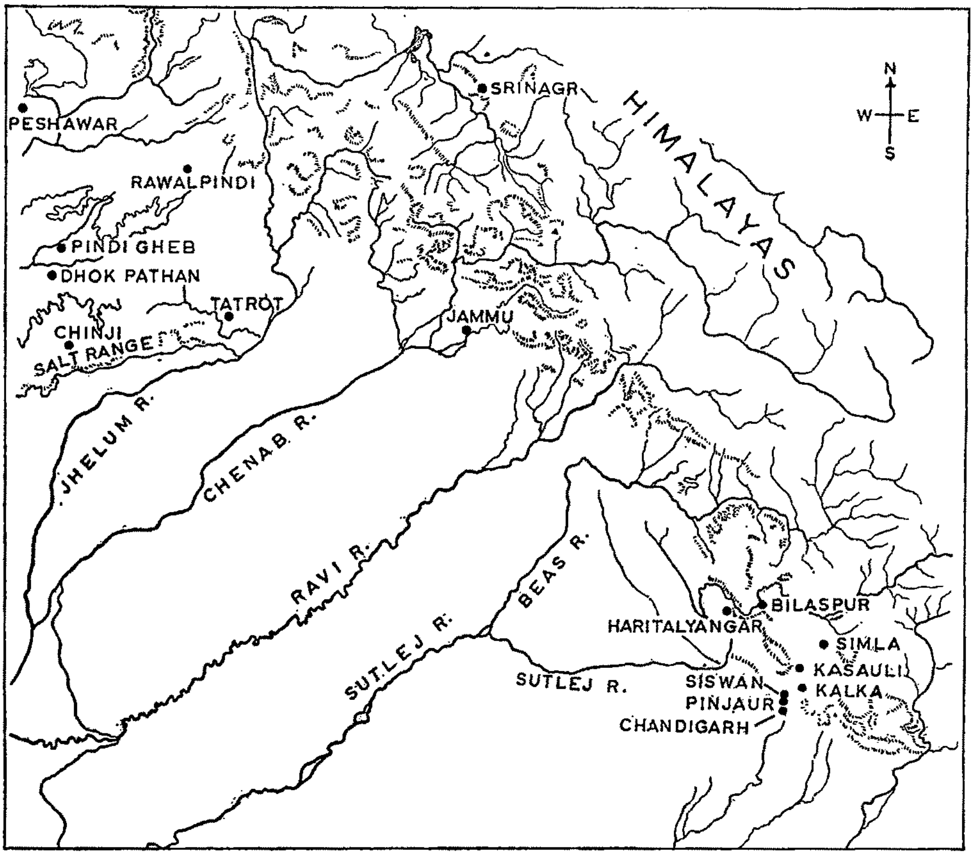


MAP 1. Map of the areas explored for fossil man by the author.

Alipur in the eastern part of the salt range (Middle Shiwaliks), Jabi in West Panjab (Middle Shiwaliks), Ramnagar in the Jammu district (Middle Shiwaliks), Hari Talyangar north-west of Bilaspur (Middle Shiwaliks) and Chakrana near Hari Talyangar. The first five localities went to Pakistan after the partition of the country while the last three are with India. Among these sites, Hari Talyangar has proved to be the richest and it was decided therefore to re-explore it under the present scheme (Map 2).

Field Work in Bilaspur (Himachal Pradesh)

Hari Talyangar is named after the twin villages of Hari and Talyangar, one situated at the bottom of the valley while the other is on the top of the hill near a scrap on which Hari temple is situated. This place is nineteen miles north-west of Bilaspur and about four miles from Dadhol, a bus halt, on Bilaspur-Ladrol road. On seeing the situation of Talyangar for the first time, one gets the impression that this area



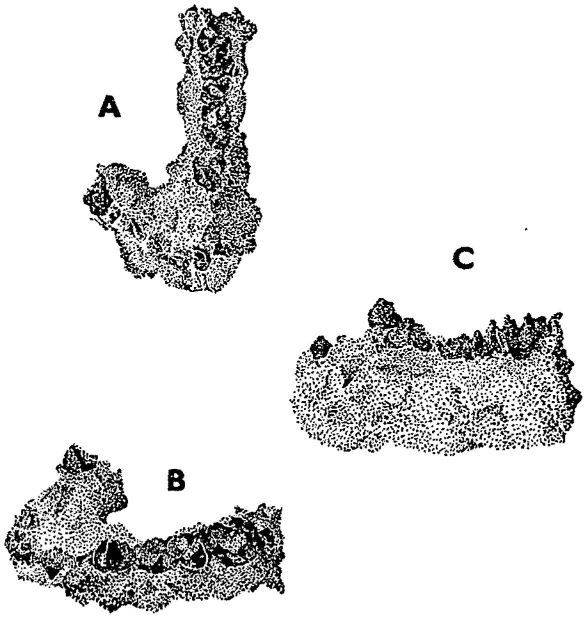
MAP 2. Map of important fossiliferous localities in Punjab and Kashmir Shiwaliks. Hari Talyangar site was explored during the present exploration.

might have once been a mighty lake. The inhabitants of Talyangar are Brahmin peasants while those of Hari are Harijans by caste but all are landowners and are farmers by occupation.

The Hari temple scrap locally known as Hari Ka Tibba, is a treasure house of primate fossils. It is only 200 metres from Hari village and its pinkish-red sandy layers belonging to the Nagri Zone are fossiliferous. An almost complete mandible of a primate resembling the present-day loris, but a little larger in size, was obtained by the writer from the loose sandy deposit of this zone. Most of its teeth are intact except one canine and one molar. It is the most important find this locality yielded during the present field work.

This area was explored in the months of May-June-July of 1959. Luckily the writer found Bhoj Ram, the man who worked with previous collectors, American as well as Indian. He was very useful in locating the old strata and in finding new ones.

Besides Hari temple scrap the other spots explored around this area were: Danger Tiba which is found on the way before Talyangar is reached and high grounds below the village of Thana on the right side of the stream flowing behind the village of Talyangar. These two localities yielded a few molars of Hipparion and some long bones of extinct animals.



Drawing of a newly discovered loris.

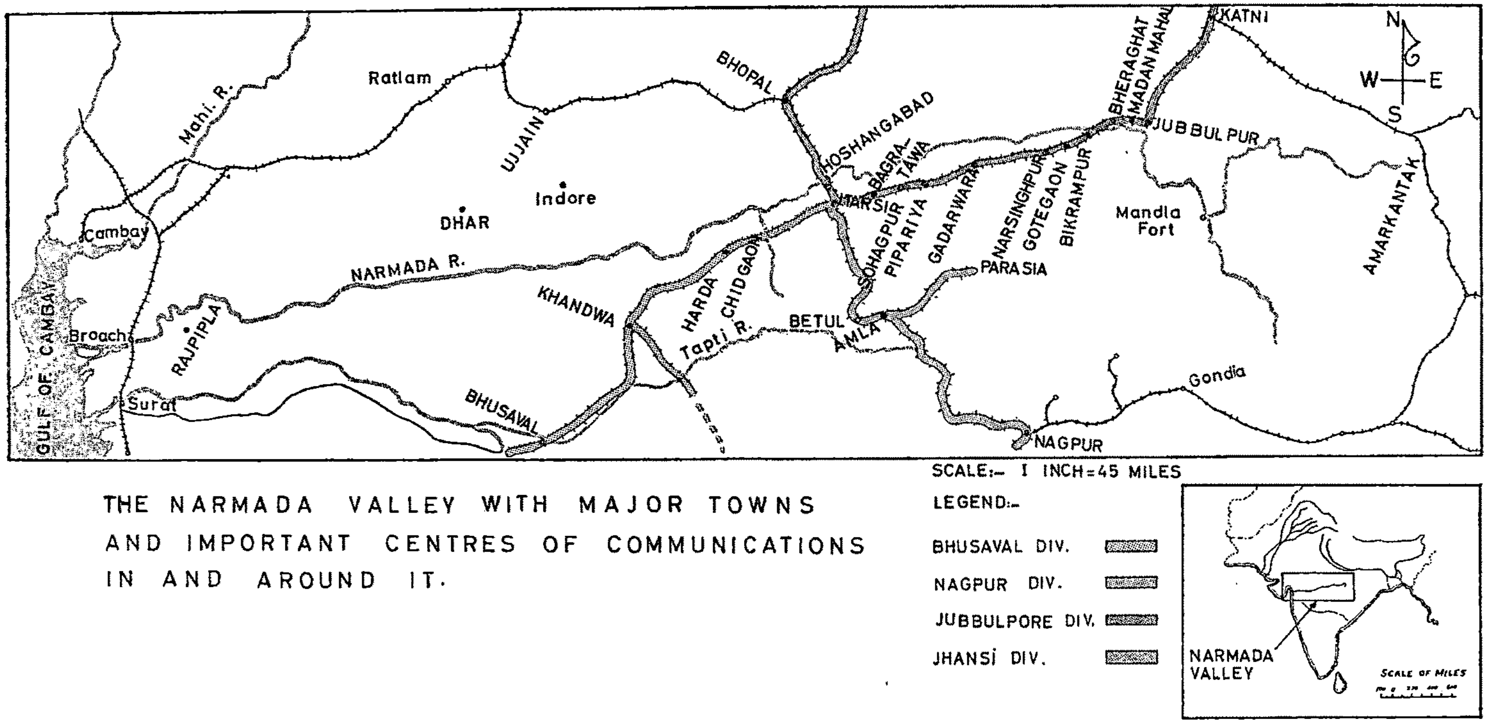
Incidentally this locality is also important for the solution of the problem of the stratigraphy of Shiwaliks, which is based on palæontological considerations. The remains of *Hipparion*, the three-toed horse, are found here in abundance and it is on the working out of its differences in relation to its North American counterpart and its time of migration to India and other parts of Eurasia, that we can place exactly the different Shiwalik Zones into a proper geological time scale.

Chakrana, the second primate yielding locality of India is situated not far off from Hari Talyangar. It is on the main Ladrol road and only four miles from Dadhol. From Chakrana the Dhaul Khan scrap is visible with its ashy-colour sand stone. Here, very good sections are exposed.

Many khads and nalas were explored around Hari Talyangar and on the way to Bilaspur. Worthy to be mentioned are:

i. Barhari Nala near Ladhani—a tributary of Sirkhad;
ii. Ahurs—seven miles northwest of Bilaspur near Bhajwani bridge;
iii. Sirkhad near Langari village;
iv. Shukkar Khad;
v. Rahul Khad;
vi. Ali Khad;
vii. Sarhali;
viii. Gambhar—12 miles from Bilaspur;
ix. Ghamrola—6 miles from Bilaspur.

Besides the mandible of a primate, the present fossil assemblage contains *Hipparion* (probably *H. antelopinum*), *Suidae*, *Proboscidea*, *Rhinocerotoidea*, etc.



MAP 3. Narmada valley with major town and important centres of communications in and around it. The area intensively explored was in between Hoshangabad and Jubbulpur.

Fossiliferous Localities in Hoshiarpur

While returning to Chandigarh, I took a different route via Unna near Hoshiarpur. At Hari Talyangar, I was informed of a fossiliferous locality called Chini Ghati, about ten miles from Unna, in the midst of a thick forest. Moreover, I knew the reports of the discovery of the Sohanian sites near Hoshiarpur which tempted me to take such a circuitous route. I examined the following localities and made a preliminary survey to be followed by intensive investigations of the khads and nalas and innumerable sections exposed in these parts. The localities from where fossils were collected are:

i. Chini Ghati *ii.* Maili *iii.* Kotla Daman *iv.* Pandogha
v. Bankhandi *vi.* Ecepur *vii.* Ram Talwali *viii.* Sidhanwal

Among all of these, Bankhandi and Chini Ghati are the richest.

THE NARMADA VALLEY

The whole of the Narmada (Map 3) is rich in Stone Age tools, but it is only the upper portion of the valley from Narsinghpur to Hoshangabad which yields implements together with fossils embedded in old deposits. Besides this advantage we also find beautiful sections and cuttings which when studied help us to reconstruct the past climates and the history of the river. Only such an area is expected to reward us with fossil man and the records, as a matter of fact, show that Theobald actually found a skull which he believed to be of fossil man in a conglomerate bed. That previous find was however lost unstudied in the treasure house of the Asiatic Society of Bengal, like the Magdalenian points of Foote from the Bilasurgam cave at Kurnool.

Previous Research

Fossils began to be collected from the Narmada in the early thirties of the last century. Spilsbury (1833–41) collected several bovine skulls from the older alluvium of the Narmada which Princep described and figured in 1834 (Pilgrim). The first one to work on the Quaternary deposits (then called Tertiary) of the valley was Theobald who published his results in a classic paper in 1860 in the 2nd volume of the *Memoires* of the Geological Survey of India. The credit of discovering the first convincable man-made 'celt' goes to Mr Hacket. The 'celt', in fact a beautiful hand-axe made quartzite, was described by Mr. H. B. Medlicott in 1873, in an article where he attacked Falconer for perpetuating the wrong conceptions on the age of ossiferous deposits of the Narmada. Falconer believed these deposits to belong to the Pliocene while Medlicott thought they were Upper Pleistocene.

Pilgrim (1905) described some fossils but there is no separate work on the Narmada as yet dealing with the fossil fauna, as in the case with Shiwaliks, probably due to the paucity of the material from that region.

The credit for making the first correlated studies in the prehistoric Pleistocene goes to the Yale-Cambridge Expedition. De Terra and Teilhard de Chardin (1939) during a brief sojourn of two weeks in 1935 brought again to our attention this region and pointed out 'its intermediate position between the glaciated highland

and the tropical belt between the mobile Himalayas and the Indian landmass'; they expressed the hope that one day solutions would be sought in the region for climatological and tectonic problems of the first importance. During their short field work they studied a few sections in Hoshangabad and Narsinghpur in the areas known previously for sections and fossils due to Theobald's work. Their stratigraphical observations were different in many respects from Theobald while their treatment of the Stone Age material was pioneering and bold. After this no work of appreciable significance was carried out in the region though Zeuner, in 1949 during his hurried trip around Indian prehistoric sites, paid a short visit to the lower Narmada system in Gujarat and made a few observations. Sankalia since 1952 has been engaged in carrying out Stone Age researches around Maheshwar area. An expedition, of which the writer was a member, was led here by Prof. T. D. McCown in 1958.

De Terra's opinions and theories remained unchallenged and his work assumed the form of a classic among the few papers written on the subject in India until the Council of Scientific and Industrial Research began to work in the area. The last two years have shown that in the area some of De Terra's conclusions on its stratigraphy and prehistory were incorrect. This was inevitable because of the short time he spent in the valley.

Present Field Work

Field work in the Narmada valley was done for about six months, in two field seasons in 1958–59 and 1959–60. The area intensively investigated, lies between Hasalpur, a village five miles downstream from Hoshangabad and Mahadeo Piparia in Narsinghpur district, though other spots on the Narmada like Maheshwar, Mandleshwar, Harda, Bherghat and Amarkantak were also surveyed and the old alluvial deposits studied. The course of the Narmada from Hoshangabad to Mahadeo Piparia is over 150 miles long, along which, more than seventy prehistoric and palæontological sites were located, some with beautiful cuttings and extensive old gravel deposits. Besides the main valley, tributaries like the Tawa, the Shukkar, the Sher, the Umar and the Barurewa were also examined over considerable length and the data collected helped to give us a general picture of the whole area lying between Satpura and Vindhyachal mountains.

A rich collection of the fossils and Stone Age tools was made during these explorations; about one thousand tools and well over two hundred vertebrate fossils which include three complete *Elephas* skulls obtained from Bhatgaon and Ajhera gravels in Sohagpur tehsil of Hoshangabad district. A large number of tools and fossils were found *in situ.*

A site with conglomerate deposits containing tools, depicting the apparent evolution of a hand-axe industry from the pebble stage to Early Abbevillian hand-axes was discovered. The industry, which seems to be the most primitive discovered so far in India, has been named the 'Mahadevian Industry' after its type site (see 'Mahadevian: The Oldowan Pebble Culture of India', *AP*, **6**: 16–17).

The Pachmarchi hills were also explored for rock shelters and caves. The old rock shelters at Adamgarh and around Pachmarhi were again visited and a rich collection of microliths was made for a detailed study of their typology.

Conclusions

Some of the main results arrived at during these investigations were:

i. Laterite. The problem of its origin and the time of its formation is important for it affects the prehistory of Orissa and Madras. De Terra opined, depending on Oldham, that it underlies the boulder conglomerate containing Middle Pleistocene fossils and that it may be of the lower Pleistocene. During the present investigation I have not come across any evidences confirming stratigraphical position of the laterite below Mid-Pleistocene conglomerate. On the other hand, at Chidgaon, a locality 40 miles from Hoshangabad on Hoshangabad-Harda railway line, a nala was discovered in which sections are beautifully exposed with the deposits overlain by the laterite. In Satpura and Vindhachal ranges the writer came across localities where laterite is still being formed. Similar observations were made in Nalamalai hills in Kurnool district on the way to Giddalur from Nandyal.

The dating of the laterite in the Narmada valley remains to be solved. Research should be done on how laterite is still being formed so as to understand the conditions of its formation in the past.

ii. Stratigraphy. In investigating the stratigraphy of the Narmada banks, it was found that the lowermost stratum is of the red greasy clay against which rests the cemented boulder conglomerate exposed at Hasalpur, Hoshangabad and Mahadeo Piparia. This gravel is fossiliferous as well as implementiferous and may very well belong to the early part of the Middle Pleistocene. The red clay can be seen at Mahadeo Piparia and Pithera on the Narmada, Tindni on the river Umar and at Gadarwara on the Shukkar. There is an unconformity after the red clay, on which rests another layer of hard cemented gravel about 8 to 10 feet thick. The cemented gravel is overlain in turn by the sandy deposits 20 to 30 ft. laid under a sluggish current. Both these strata are again fossiliferous and implementiferous. Sometimes these sandy deposits merge with the yellow clay formed upon it and this yellow clay is capped by the black cotton soil. This sandy deposition sometimes shows bends and curves suggesting that they have been affected by earth movements. This phenomenon was noted at Tindni and at Gadarwara.

The above observations differ from De Terra in the following respects:

a. They refute the triple cycle of deposition in the Narmada valley. Only two cycles were observed and the first cycle starts with Red Clay and not with the boulder conglomerate.

b. No black cotton soil gravel was observed as such.

c. The position of the boulder conglomerate was observed to rest against the red clay and not lying beneath it. The concretionary clay, which forms the banks of the Narmada at Hoshangabad, is not the lower clay, as may confuse people at the first sight, but the second clay with a little more red hue and concretionary content.

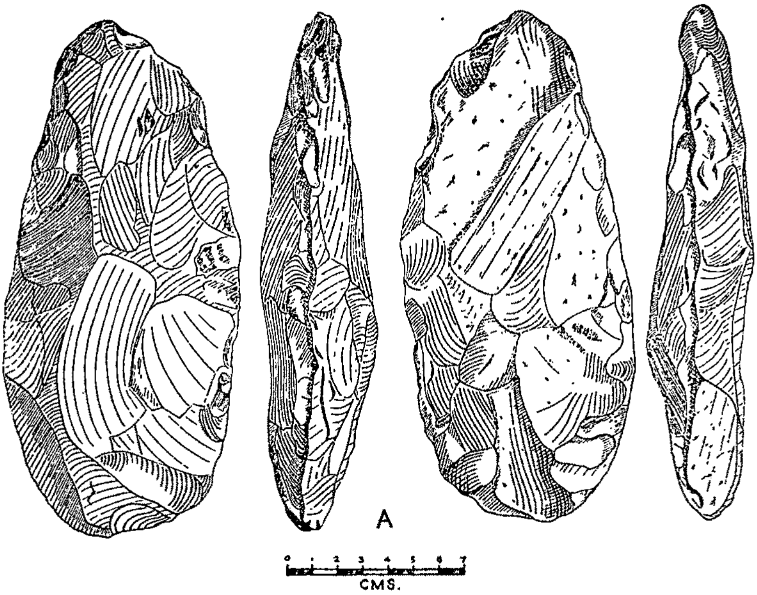
Our investigations here have succeeded in 'fixing' of the Stone Age industries in the stratigraphy of the Narmada.

Fig. 1. NARMADA HAND-AXES

a. A beautiful oval shape, Acheulian biface with round butt and flat, tongue-like apex. The working edge wavy and alround. Both the surfaces upper and lower are chipped all over by shallow flaking material: fine grained red quartzite. Semi-rolled. Found at Budhni gravels, Hoshangabad. Measurements: 196 × 90 × 41 mm.

b. A pear-shaped biface made on fine-grained quartzite. Butt-end broad and round. Apex rounded and elongated. The working-edge limited to the lateral sides. The right lateral edge has a slight 's' twist. The upper face with a cortex on the lower half of the tool and on the hump situated in the middle of the artifact. From the hump towards the tip, the tool has been flaked deeply resulting in much thinning of that portion. The underside has a shallow flaking almost allover except a small patch on the left of the butt-end. There is a small hump below the centre, with converged flaking alround. Partially rolled. Loc.: Bhagwara gravels, Hoshangabad. Measurements: 141 × 89 × 59 mm.

c. A pear-shaped biface on coarse grained quartzite of greyish brown colour and was chiselled out *in situ* from the cemented sandy gravel (gr. II) at Bhagwarā side of the Narmada, opposite Hoshangabad. Butt is broad and round; apex tongue-like and the working edge wavy and alround. The upper face worked all over with controlled flaking and with a meandering ridge running from the butt end to the tip. The underface also flaked all over. Partially rolled. Measurements: 153 × 85 × 51 mm.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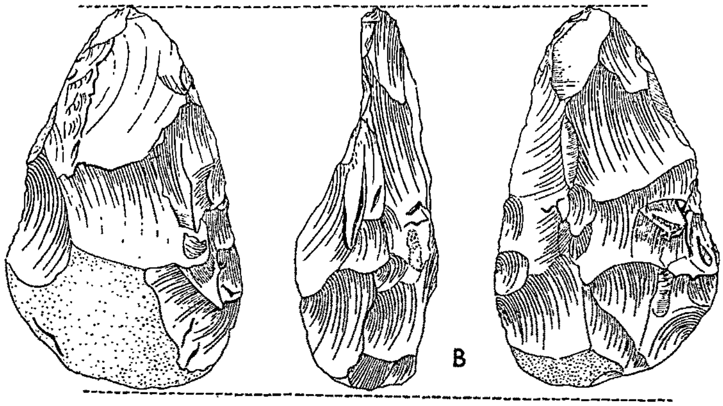
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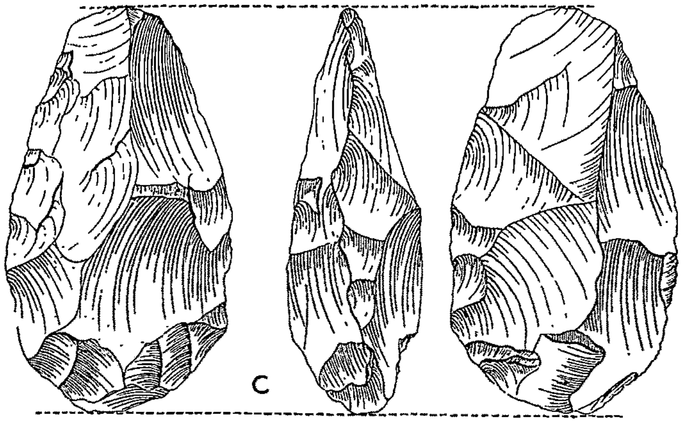
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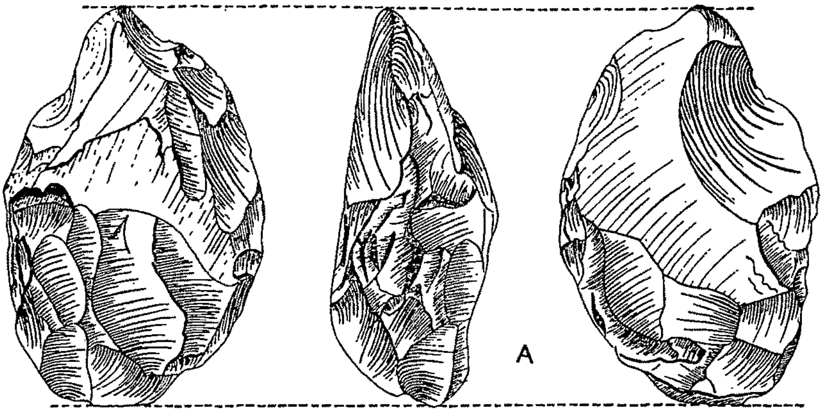
FIG. 2. NARMADA HAND-AXES

a. A thick pointed ovate specimen, on fine-grained red quartzite with a small inside-curve on the left side just below the tip. The working edge blunt and alround. The upper face has a hump above the centre and is flaked all over. Many 'steps' present especially along the left side. The under face has a deep scar on the right side below the short and thick tip. Partially rolled. Loc.: Recovered from the Budhni gravels, Hoshangabad. Measurements: 126 × 84 × 51 mm.

b. A double-pointed specimen made on greyish brown, medium-grained, quartzite. Recovered from Budhni gravels. Hoshangabad. The working edge alround except on the upper part of the right lateral where there is a platform-like surface. The upper face is worked all over. 'Thinning' has been attempted along the periphery. Many deep 'steps' present. The under face worked all over but during the rolling process the flake scars have been rubbed too much. Here also deep 'steps' occur. Measurements: 131 × 85 × 42 mm.

c. A semi-rolled, pear-shaped biface, on a fine-grained red quartzite. The butt-end is straight and narrow with unprepared, elliptical platform at the base. The tip is short and pointed and the working edge wavy, alround, except at the butt-end. The upper face has a hump in the centre and many 'steps' occur along both the sides. The under face has broad, shallow flaking with a small slightly pointed hump a little above the middle. A big oblique 'step' above the butt. Loc.: Budhni gravels, Hoshangabad. Measurements: 125 × 71 × 46 mm.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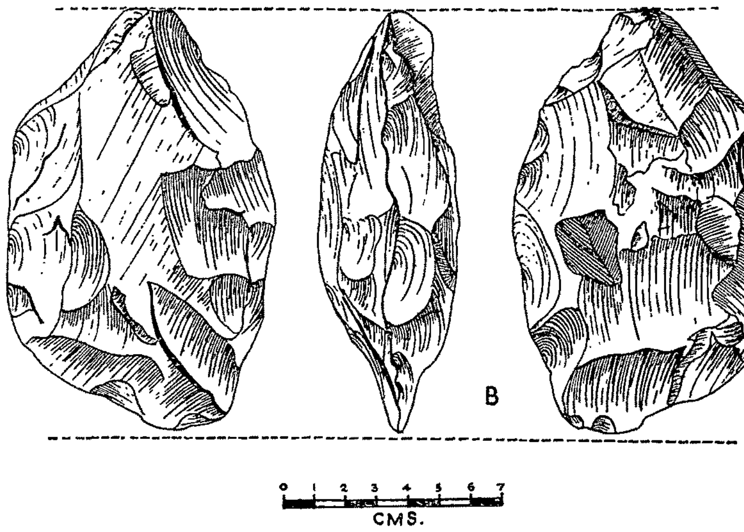
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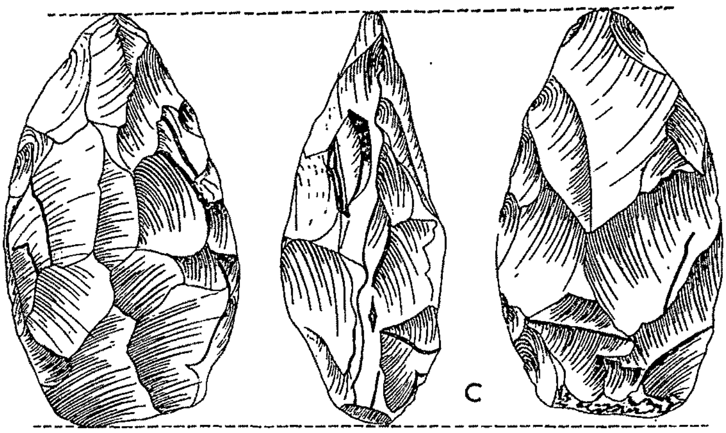
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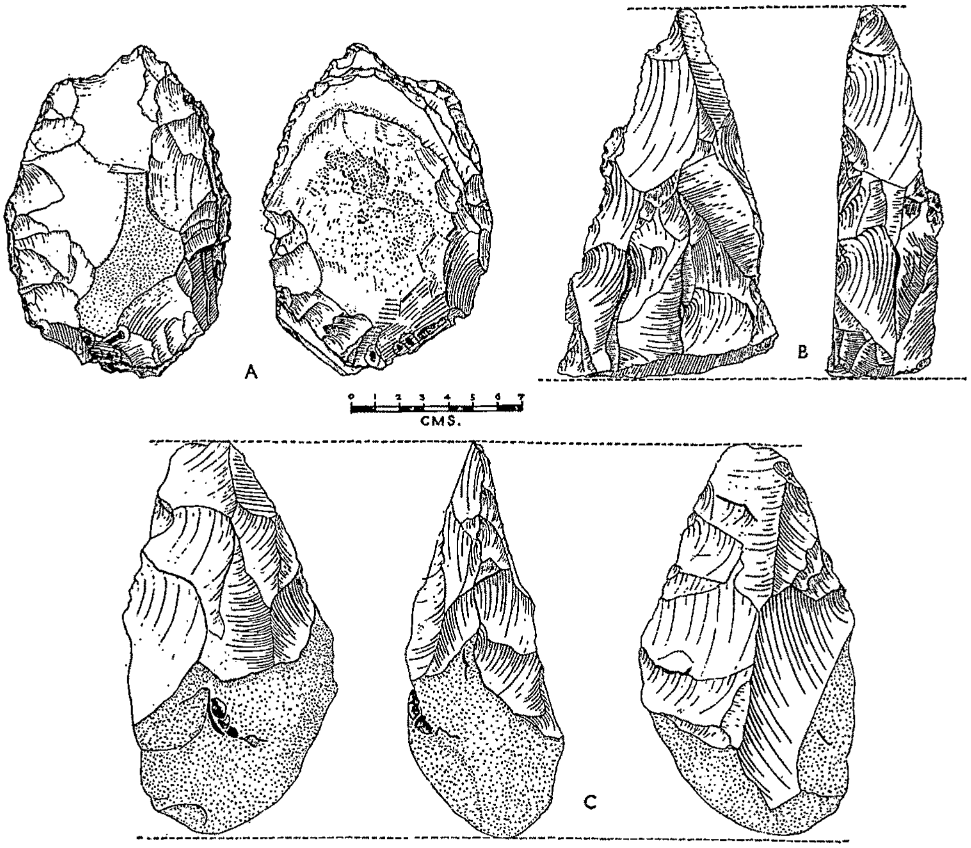

FIG. 3. NARMADA ARTIFACTS

a. Of unrolled, choradate shape, advanced Acheulian hand-axe made on chert in which can be distinguished three horizontal joints or plates sticking one over the other. The upper face of the specimen is covered with original cortex while the under face shows shallow flaking mostly along the periphery leaving in the centre a patch of original cortex. The working-edge is alround, sharp and irregular. Loc.: Found *in situ* in the upper sands, River Sher, Devakachhar. Measurements:

b. A fresh, sharp lance-head type of tool with a pointed tip and vertically flat triangular butt-end base to which the limy concretion is still sticking. The upper face is worked while the under face is flat, smooth, with no flaking at all and is patinated brown. There is an irregular centrally running ridge on the upper face which starts from the apex of the triangular base and ends at the tip. The sides are steep, making 45° with the ridge and from sharp edges with the ventral plane converging at the tip. Near the tip, on the left side of the ridge is a deep flake scar which covers the upper 1/3rd of the side. Loc.: Found *in situ* in upper sands of River Sher, Devakachhar. Measurements: 147 × 86 × 42 mm.

c. An unrolled fresh, Acheulian hand-axe made on fine-grained red quartzite. The lower-half of the specimen is pebbly and retains the original cortex of the rock. The upper half has been thinned from both the dorsal and ventral side by characteristic Acheulian method of wood-hammer technique. The shape is almond with tongue-like, short and straight apex. The butt end is narrow, thick and unworked. The working end is limited to the upper half of the tool and is remarkably sharp and wavy. The upper face has a hump in the middle and the flaking begins from it upwards. The underside is covered

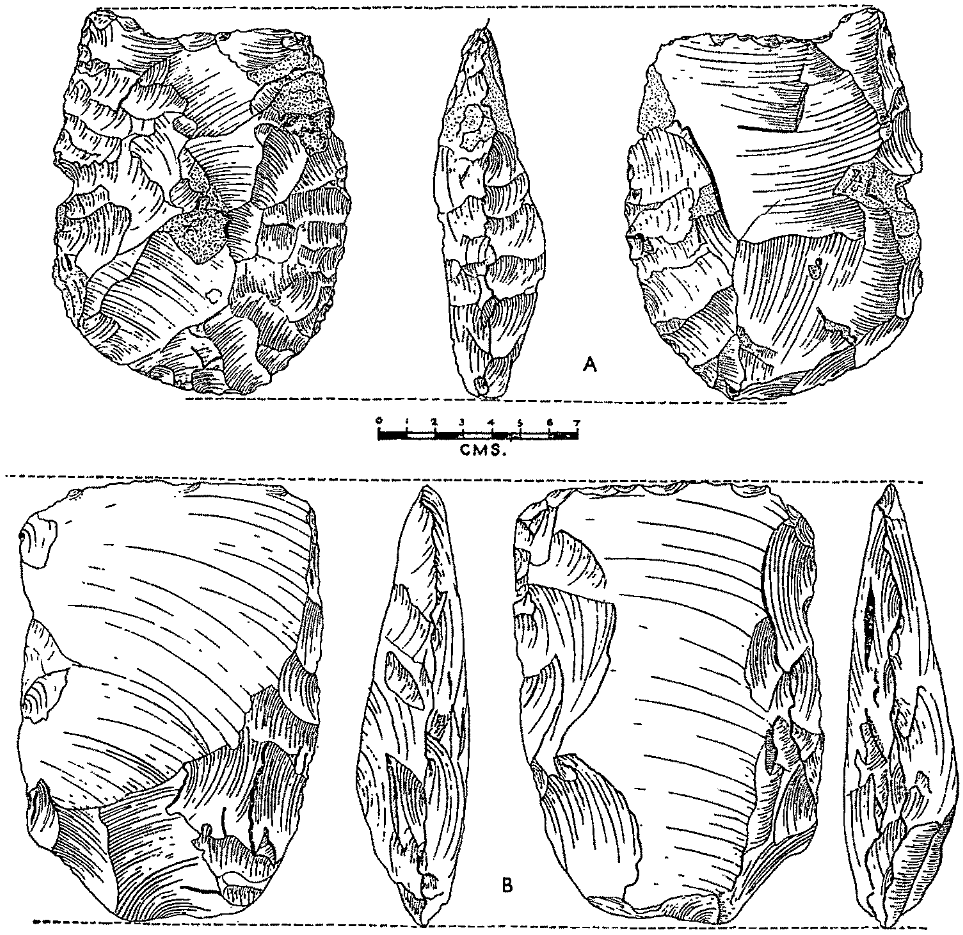

FIG. 4. NARMADA ARTIFACTS

a. A fresh, unrolled, beautiful Acheulian U-shaped cleaver made on honey-coloured jasper. It has a round butt-end and a nearly straight working edge except on the right where there is a concavity. This is a specimen where controlled shallow flaking by wood-hammer technique can be convincingly demonstrated on both the surfaces. The only flaw in the otherwise exceptionally beautiful specimen is the presence of many patches of original cortex on both the sides. Loc.: Found *in situ* in the upper sands of River Sher, Devakachhar. Measurements: 126 × 101 × 35 mm.

b. A good specimen of U-shaped-cleaver on medium-grained red quartzite; semi-rolled. Butt-end irregular and roughly semi-circular; the working edge straight and is a result of intersecting of two big flake scars, one from each surface. The upper face worked along the lateral sides, by 'step' technique. The under face is covered by a large flake which meets its counterpart from the other side to make the edge. The right-half of the butt-side is further chipped and there occur many 'steps'. Loc.: Budhni gravels, Hoshangabad. Measurements: 152 × 102 × 37 mm.

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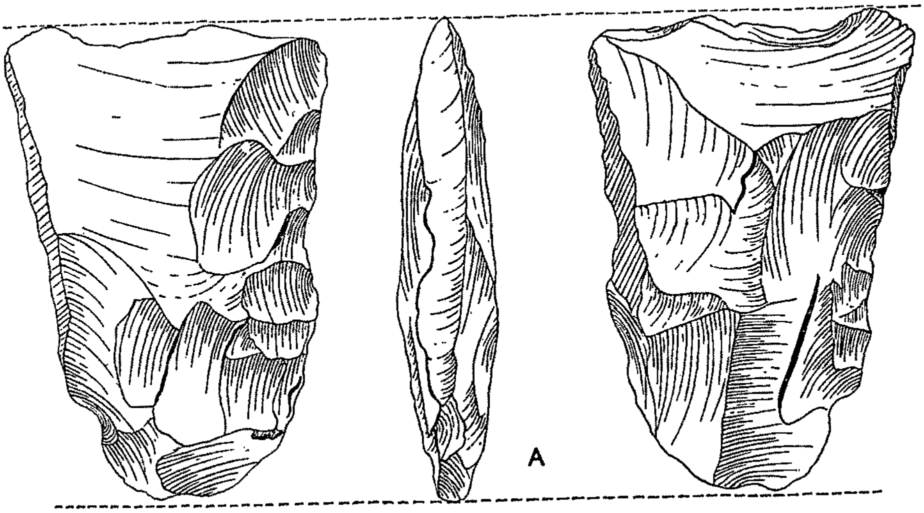
by flaking all over except the right and left sides, of the lower half which still retains the original cortex. Loc.: mouth of the River Barurewa, Devakachhar. Measurements: 159 × 84 × 56 mm.

Fig. 5. NARMADA CLEAVERS

a. V-shaped, on dark red, coarse-grained quartzite. Quite rolled. Butt-end round and narrow; working edge broad and relatively straight and is made by big flake scar coming from the underside and meets the rim of the upper face. Loc.: Bhagwara gravels, Hoshangabad. Measurements: 133 × 94 × 28 mm.

b. V-shape, with oblique transverse working edge and narrow, pointed butt-end. The upper face exhibits three-layer flake scars, the anterior one meeting its counterpart from the underside to form the edge. The underside presents a clean surface with a prominent bulb of percussion at the top of which is a striking platform. Material: light brown quartzite. Semi-rolled. Loc.: Budhni gravels, Hoshangabad. Measurements: 125 × 119 × 38 mm.

c. A beautiful U-shaped specimen with oblique edge made on light brown, medium grained quartzite. The upper face of the cleaver is worked all over except the area adjoining the working edge which is formed by a single flake scar joining the under surface to form a sharp edge. The under face is 'clean', with positive bulb of percussion and prepared striking platform. Slightly rolled. Loc.: Ramnagar. R. Narmada. Measurements: 99 × 74 × 31 mm.



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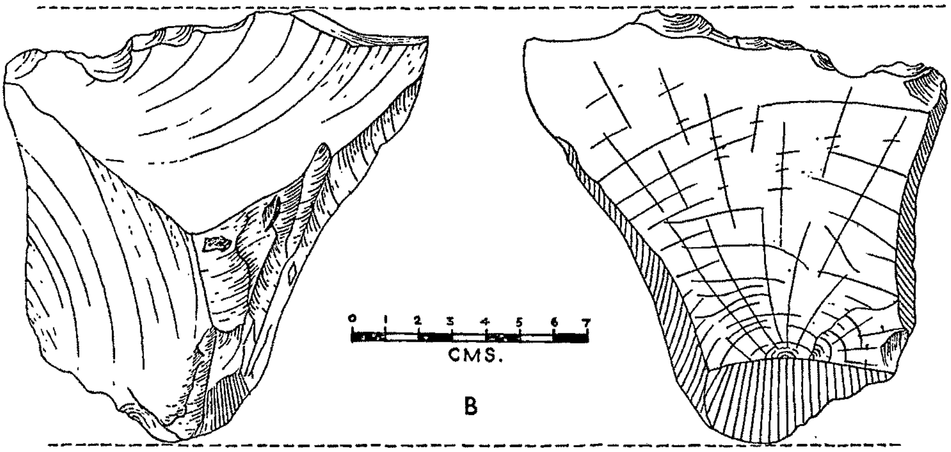

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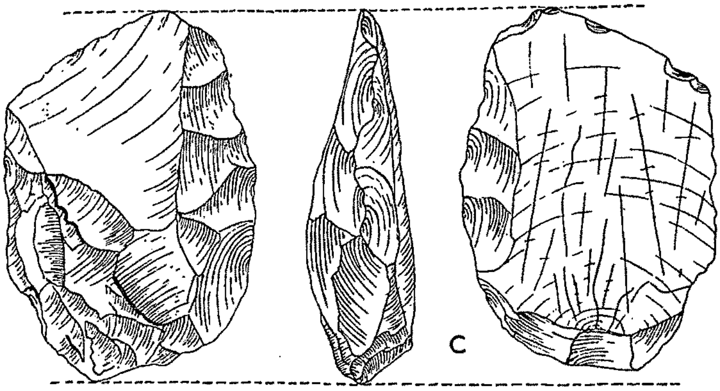

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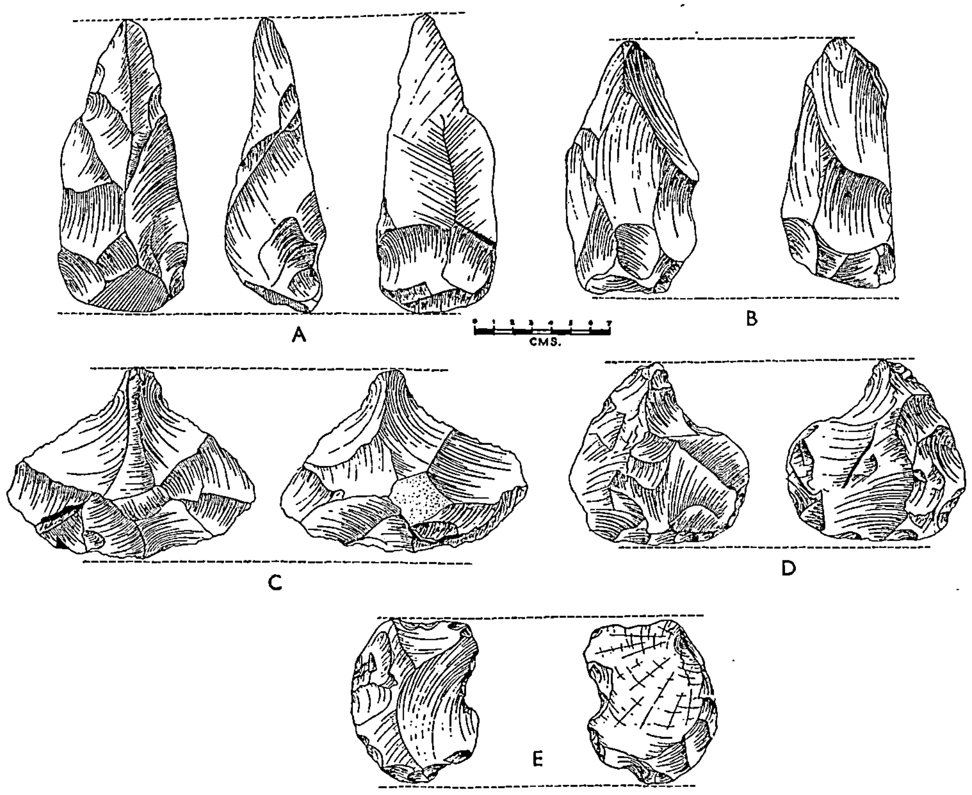

Fig. 6. NARMADA ARTIFACTS

a. Of tetrahedral shape with long pointed apex made on light brown quartzite. The butt-end consists of an unworked smooth platform. The apex is long and pointed. The working edge wavy and alround. The upper face has a ridge which starts from a hump at the butt-end and tapers down to the tip. The sides are steep and worked. The under surface is worked but rolling process has dimmed the flake scars. Loc.: Bhagwara gravels, Hoshangabad. Measurements: 145 × 66 × 57 mm.

b. A specimen with polyhedral, prismatic structure on a triangular base, made on light brown quartzite. The butt-end has a base made of an almost round flake. The apex is short and blunt. The upper face has a wavy ridge going from the butt to the tip. The flakes are deep and broad. The under face is clean and smooth. Semi-rolled. Loc.: Budhni gravels R. Narmada. Hoshangabad. Measurements: 125 × 64 × 61 mm.

c. A triangular specimen with semi-circular bottom and short, pointed tip. The material is medium-grained red quartzite and is unrolled. The tool is worked on both the sides and has a sharp edge alround. The upper face has a hump in the centre and the flaking is centrepetal. The underside has also a hump in the centre and seven flakes can be counted which have been removed centrepetally. The top of the hump is left with a patch of original cortex. There are limy encrustations on the right side of the upper face. Loc.: Found *in situ* in upper sand being eroded, on the left of the road coming from Devakachhar village. R. Sher, Narsinghpur district. Measurements: 126 × 94 × 48 mm.

d. A chordate-shaped artifact, nicely made, specimen with a beaked tip, worked on both the sides by controlled flaking; 'steps' present. The edge alround. Material: fine-grained quartzite. Loc.: Budhni gravels. Measurements: 86 × 92 × 30 mm.

At Hasalpur, Hoshangabad, and Mahadeo Piparia a very primitive industry was located. It is similar to the earliest phase of the Chellian stage of the hand-axe tradition. In Africa this stage belongs to the Lower Middle Pleistocene, i.e. to the end of the Kamasian Pluvial. It is mainly a pebble industry with huge, heavy, crude tools similar to those found in the basal layers of the 2nd bed at Olduvai Gorge in East Africa.

The next bed to yield tools is the 2nd cemented gravel. Tools were chiseled out *in situ* at Devakachhar, Ratikarar, Saguan Ghat and Barman Ghat. Typologically they belong to the Late Abbevillian to Early Acheulian stage.

The sandy layers deposited in cross-current above this cemented gravel yields advanced Acheulian-like tools showing controlled flaking by cylinder hammer technique. The material of these Acheulian-like hand-axes includes some finer stone material like chalcedony, jasper and surprisingly flint also.

Along with these fine hand-axes, we find a scraper cum point industry on jasper and chalcedony known generally as Series II. The fossils found associated with these suggest that these industries flourished in Late Pleistocene times. The Series II industry might have continued to flourish in the Holocene and might have given rise to the microlithic industries. These Series II tools were found *in situ* at Devakachhar and Barman Ghat. The occurrence of typologically late Acheulian tools and Series II together in the same layers indicate that they were contemporary. The prehistoric folk manufacturing Series II tools influenced the people making Acheulian-like tools in the choice of better stone material while the latter would taught the former their refined flaking technique.

The Kurnool Caves

The exploration work in this area was carried out in the months of January and February 1962. Work began at Kurnool town in Andhra Pradesh with the famous bone caves of Billasurgam and other groups in its vicinity. Besides visiting six old groups of caves, Billasurgam, Krishnamakona, Sanyasulgavi, Gurlagutta and Yaganti, the writer discovered three other caves in a gorge, thickly forested in the Neelakoya valley. In these large size caves, situated more than 15 feet above the ground level, were found undisturbed floor debris. Near Bugga temple on the Kurnool-Betamcherla road, one rock shelter with paintings in red ochre was discovered with chalcedony microliths (fluted cores, scrapers, points and flakes) in its vicinity.

A megalithic site was also discovered on the northern bank of the Tungabhadra behind the medieval fortress, opposite the town of Kurnool (Map 4). The site was on a mound, now a ploughed field, with a scatter of pottery and neoliths all around. Near this megalithic site, there are some high grounds, on which a large number of Series II tools made on jasper were obtained.

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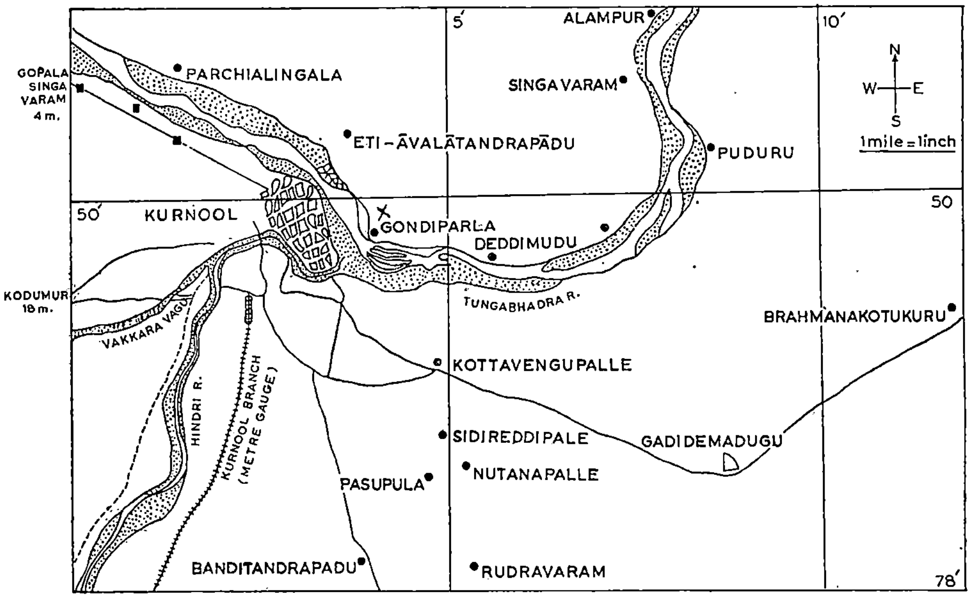
e. A hollow-sided scraper on light brown fine-grained quartzite. The under face exhibits a big flake removed in a manner reminiscent of the Levalloise technique. The hollow scraping side seems to have been used as shown by battering marks. Semi-rolled. Loc.: Bhagwara gravels Hoshangabad. Measurements: 79 × 65 × 21 mm.



MAP 4. River Tungabhadra at Kurnool, Andhra Pradesh. The mark × opposite Kurnool town represents the megalithic site discovered during the present exploration.

Previous Research

The Billasurgam caves were first reported to the scientific world in the 1840's by Captain Newbold, F.R.S. who found them to be ossiferous and made a small collection which was never described and was subsequently lost. For sixty years nothing was done till Prof. Huxley asked Sir M. E. Grant Duff, then Governor of Madras Presidency, to have it explored. As a result Robert Bruce Foote, the Superintendent of the Geological Survey of India, was instructed to explore and excavate the caves to procure the material afresh.

In 1884, Bruce Foote and his son Lt. H. B. Foote revisited the caves. While Bruce Foote was busy on other matters his son conducted the excavation and procured a large collection of fossils. These were sent to Calcutta to be described by Lydekker in *Palæontologia Indica* (1886), and were found to belong to the Pleistocene. Besides fossils, H. B. Foote obtained a number of artifacts which to his father seemed to be Magdalenian in type. This Magdalenian type of material included a pendant made of bone. This material also was lost.

Present Exploration

L. A. Cammiade, at one time the Collector of the Kurnool district, visited these caves and in a paper published in 1927, he said that Foote's failure in not finding the fire-hearth and prehistoric tools in the caves was because the excavations were made inside instead of at the entrance.

His contention was that present-day entrances were in prehistoric times dark and humid places not worthy of human habitation and that the high-walled passages leading to the present-day chambers were well lighted, spacious and fit for living. And if these canyon-like passages are explored and cleaned of roof-debris, there is a possibility of finding ashy floors and prehistoric cultural material and the much sought bones of fossil man himself. In view of this, the caves were thoroughly explored by us thirty years after Cammiade's search. Cammiade may be right but his suggestions are workable only, when the roofless hall in front has been cleared of hundred of tons of debris fallen from the roof and the jungle cleared.

Caves Examined

The following groups of caves were examined, the numbers associated indicating the number of caves and chambers in each group.

i.	Billasurgam Caves	7
ii.	Sanyasulgavi Caves	4
iii.	Krishnamakona Cave	1
iv.	Yaganti Caves	5
v.	Gurlagutta Caves	1
		18

Besides the above, five unrecorded caves and two rock shelters were discovered. These are:

i. Three caves and one rock shelter in a gorge near the Bezwara-Guntkal railway line near Paniyam;

ii. Two caves known as Tamarind Caves in Neelakoya Valley;

iii. One rock shelter with paintings at Bugga.

Areas Explored

New areas were explored to find new caves with virgin floors. The following is the list of the areas explored:

i. Rocky area which falls on the Kurnool-Nandyal Road at 12th mile stone from Kurnool;

ii. the high ground on the other side of Tungabhadra opposite Kurnool town;

iii. Nandyal area;

iv. Betamcherla range;

v. Bugga temple area;

vi. Paniyam lime stone hill;

vii. the deep gorge between Gurlagutta and Betamcherla;

viii. Yaganti hills and Mola-Ka Pahar in Bugganpalli;

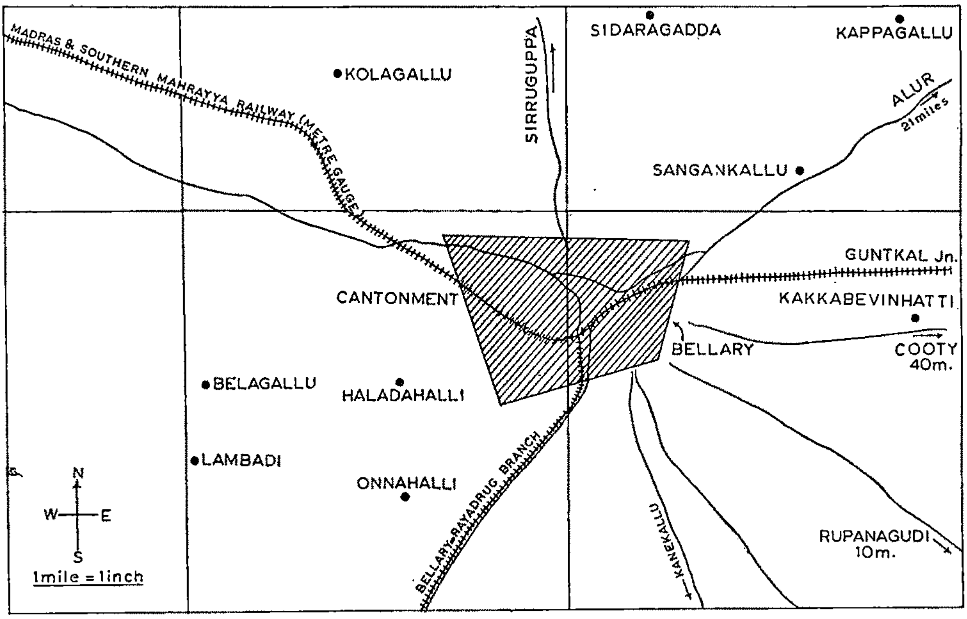
ix. Bellary regions; and

x. Giddalur—Markapur area in Nallamalai.

Material Collected

No finds were made around the caves; the many flakes which we saw appeared to me the work of present-day stone cutters. Bruce Foote found a very much rolled specimen like a hand-axe. The specimen, which I examined in the Madras Museum, is far too rolled and is not to be attributed to human agency.

Neoliths were collected from the top of the Sannarasamma hill near Sangankallu about three miles northeast of Bellary town (Map 5). In the collection were a few new types of neolithic cells and axe-like cores bearing a superficial resemblance to the Acheulian hand-axes. The importance of this discovery lies in that such cores were found at Sukkar and Rohri flint factory sites in Sind, the blade industry of which is regarded as pre-chalæolithic.



MAP 5. Town of Bellary and village of Sangankallu, a neolithic habitational cum manufacturing site, in Mysore state.

SURVEY OF THE SAGILERU VALLEY, GIDDALUR, KURNOOL DISTRICT

Gundlakama-Markapur area is one of the earliest where stone tools were collected and commented upon (Cammiade and Burkitt 1930). The writer became interested in the terrain and particularly the Sagileru valley after going through Soundara Rajan's article (1952) wherein, he discussed the Stone Age industries and a few sections he thought to belong to the Pleistocene. He discussed two sites, Giddalur I and Giddalur II, which are within 200 metres of one another on the river Sagileru, and said that one contained a Levallois element while the other did not.

After examining the Sagileru banks and the deposits, I found that the section—the photograph of which Soundara Rajan included in his article (1952)—was of very recent origin without relation to any Pleistocene sequence. Such sections are to be found in the river after any flood season.

A large number of tools were collected from the two particular spots mentioned by Soundara Rajan so that the industry may be studied in detail. In my collection there are many flakes similar to those illustrated by Soundara Rajan which have faceted platforms. But, a faceted platform does not make a flake Levallois when it possesses also very obtuse angles. The study of African prehistory, particularly of South Africa, shows that the prepared platform technique was developed independently by hand-axe manufacturing folk long before the Levallois element reached there. Mr Soundara Rajan compared the tools with South Africa but missed the point and drew wrong conclusions from a small collection.

Three terraces were noted on the river Sagileru, the topmost being the earliest. These terraces can provisionally be named as T1, T2 and T3. On T1 was found a factory site with a large number of fresh tools. On T3, which is formed by the present bed of the river, tools obtained were rolled are possibly derived from T1 where Stone Age man lived and manufactured his tools and weapons.

The microlithic industry on quartz described by Soundara Rajan from that area was also not confirmed by my exploration. On the river Sagileru very near the hill on which a temple is situated, quartz veins occur in abundance and in the fields and around the hill area the small pieces of quartz lie scattered about. Those small pieces have been taken by Soundara Rajan as microliths. After examining the collection of more than one thousand pieces with a magnifying glass I came to the conclusion that they are natural. A similar case was noticed at Sangankallu where Subbarao (1948) described a quartz microlithic industry. There also quartz veins are in abundance and because of its brittle nature the whole area around the hills is full of such pieces. The writer found microliths on chalcedony and chert but on brittle quartz, he found none. Any retouching apparent on the quartz pieces should be taken with reserve because of the brittle nature of the material. In the present circumstances I do not regard the quartz microliths from Giddalur and Sangankallu, the places of which I have first hand knowledge, as genuine.

From the Narmada evidence, and taking into account the typology and technique, one could date the Palæolithic industry of Sagileru in between the late Middle Pleistocene and Upper Pleistocene.

ACKNOWLEDGEMENTS

I would like to thank Dr M. R. Sahni, Head of the Department of Geology, Panjab University, who was in charge of this research project; Dr H. D. Sankalia, Director of Deccan College and Post Graduate Research Institute, for proposing my name for this work, and; Dr D. N. Wadia, Chairman of the Geological Research Board of the Council of Scientific and Industrial Research, for awarding me the Senior Post-Doctoral Research Fellowship to do this work.

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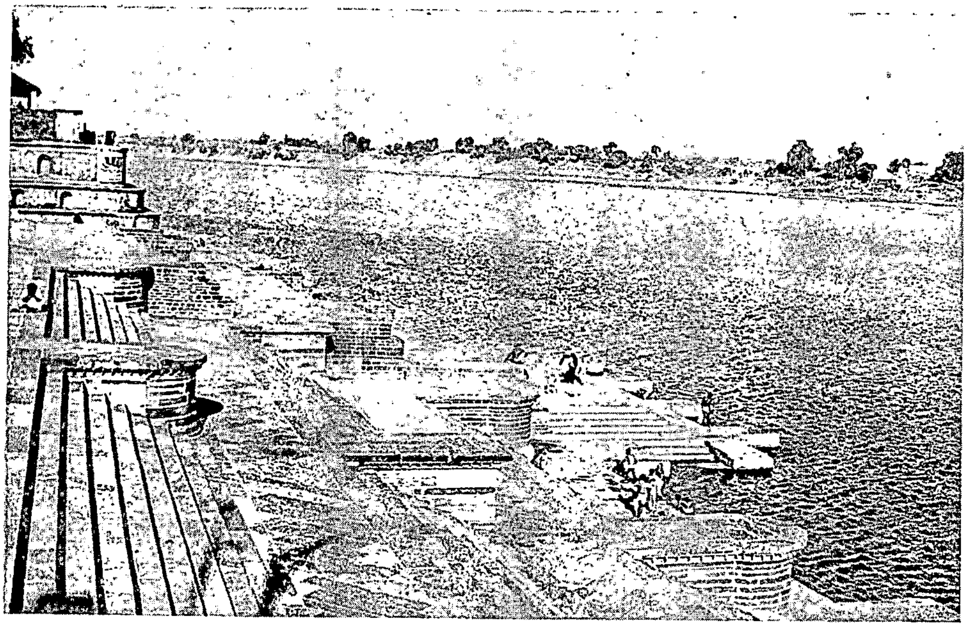
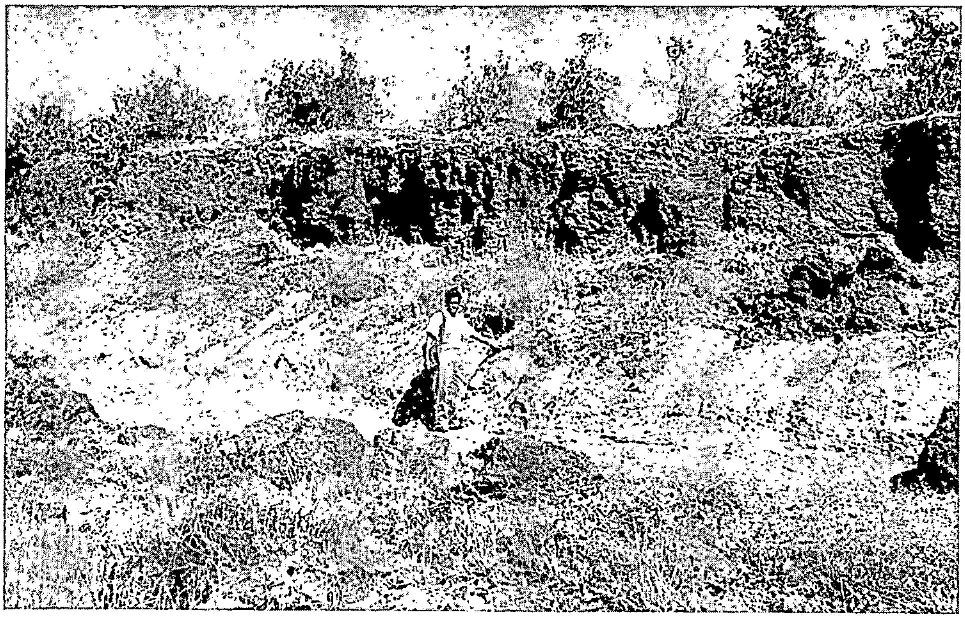
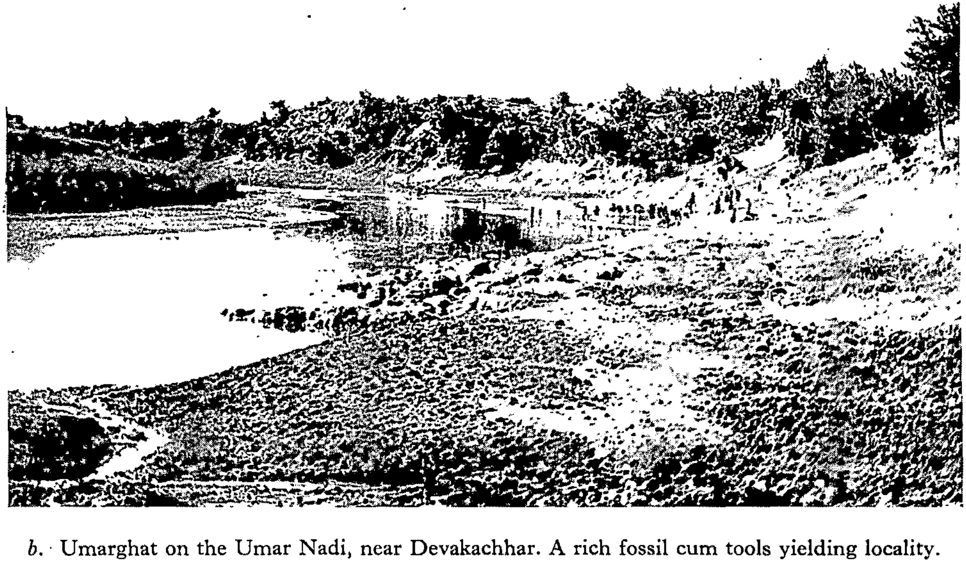


a. River Narmada at Hoshangabad, in the background the Vindhyachal mountains.



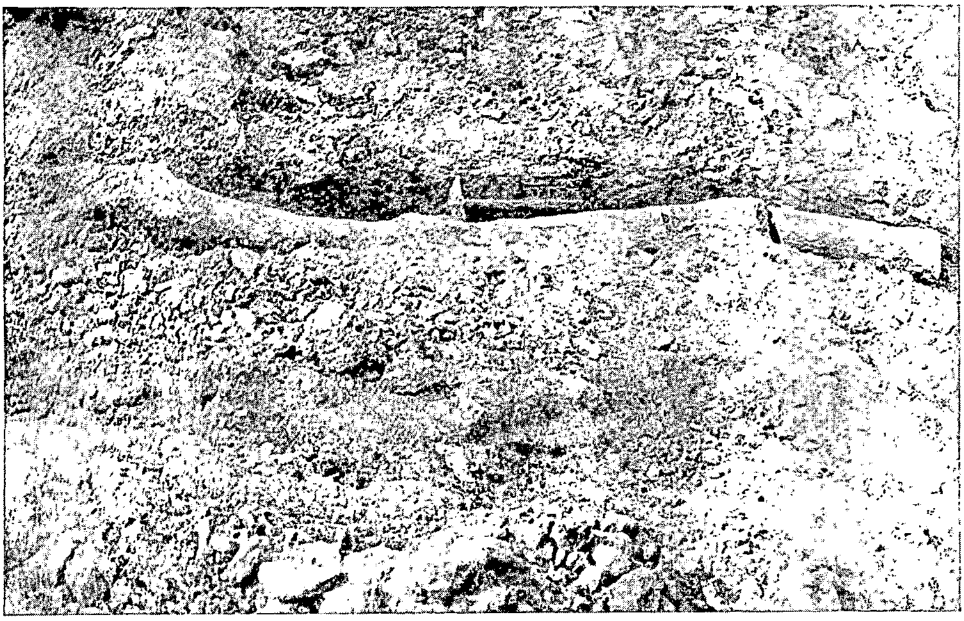
b. The Laterite section at Chidgaon. Note the thick, black stratum of laterite at the top.

a. Sher Nadi at Devakachhar in Narsinghpur district, Madhya Pradesh. Note the eroded section on both the sides of the passage coming from the village. Many vertebrate fossils were collected from this place.

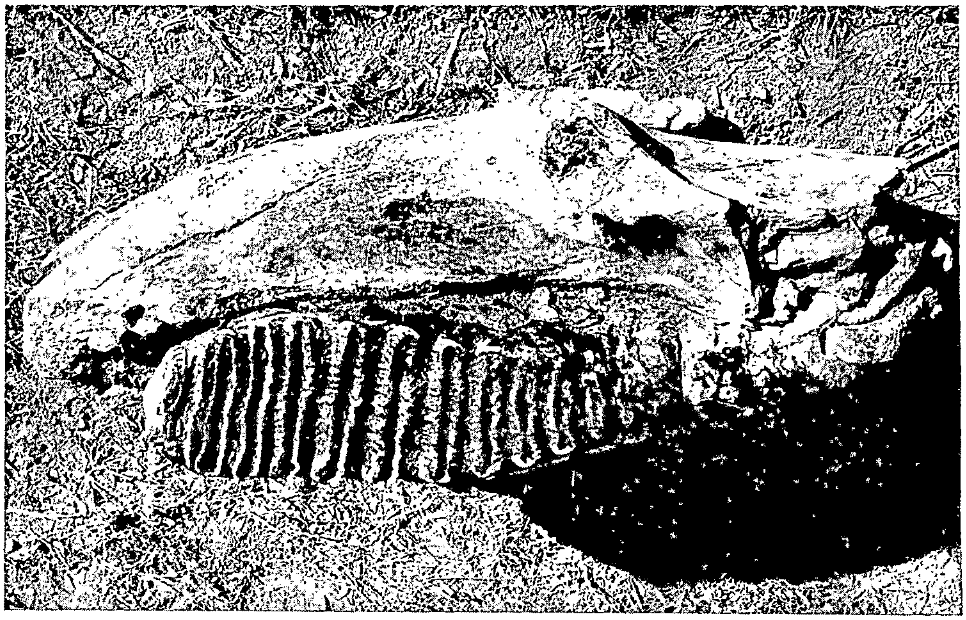


b. Umarghat on the Umar Nadi, near Devakachhar. A rich fossil cum tools yielding locality.

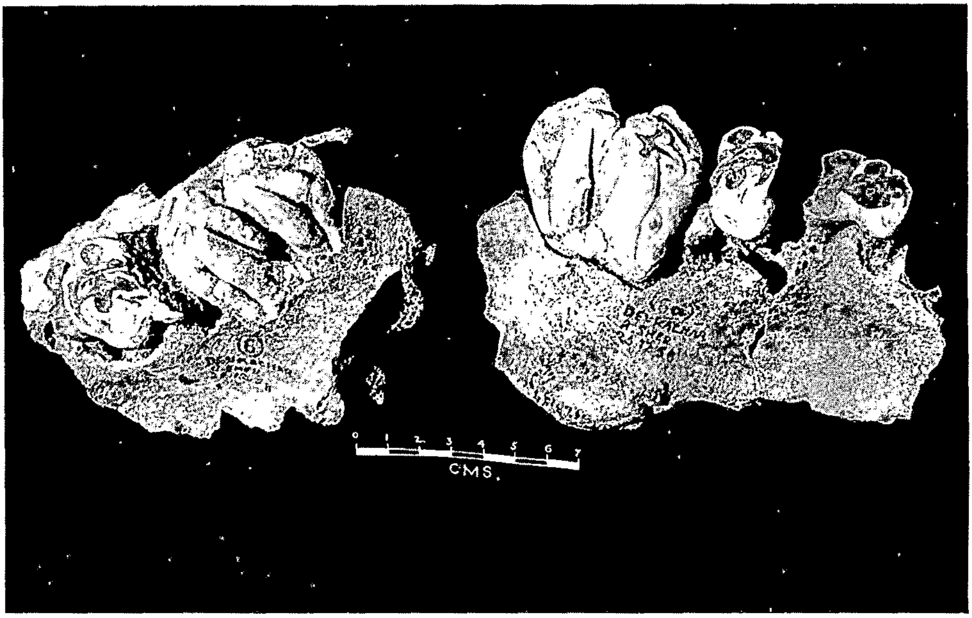
a. An early Stone Age factory site around a green quartzite outcrop on the Narmada near Barman ghat in Narsinghpur district. A rich assemblage of tools were obtained from here.



b. An elephas tusk found *in situ* near Kharra ghat on the Narmada at Hoshangabad. It measures 2·14 metres (7·05 ft.) in length along the outer curve and is 51 cm. (2·00 in.) maximum circumference near the root-end.



a. A molar of *Elephas namadicus* found at Devakachhar in the eroded sand of upper sandy layers.



b. Hippopotamus molars found in the eroded sand of upper sandy layers at Devakachhar.

6

Prehistoric Pakistan

AHMAD HASAN DANI

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Pakistan consists of two distinct geographical zones—one separated from the other by a thousand miles of the Indian territory. The eastern wing (Dani 1960: ch. 1) is mainly the delta of the Ganges and the Brahmaputra, fringed with tertiary uplift and folding on the north and the east. The main deltaic region is a *khadar* area, the new alluvium overlapping the old, and though the old alluvium is traceable in the red lateritic soil of Barendra (northern part of East Pakistan) and much more so in the Lalmai-Mainamati Range in Comilla district and near Sitakund in Chittagong district, nothing has so far been discovered about early man in this region. Only in the hilly parts have some neolithic tools been found. 'A piece of fossil wood, pointed, elongated, one side flat, truncated butt, beautifully polished' was picked up from Sitakund (Brown 1917: 130). Four more specimens are preserved in the British Museum. All of them are varieties of the faceted tools of Assam (Dani 1960: 87). Some years ago Robert Dyson paid a visit to the Chittagong hill area and collected more examples. As far as I know, these tools also belong to the same culture complex.

West Pakistan is the child of the Indus. The Indus basin is bordered on the west by the southerly offshoots of the great Himalayas and on the east the great Indian desert, the only gap into India being the narrow passage between the desert and the Himalayas—the great *Kurukshetra* of the Indian tradition—leading directly to Delhi. The great Indus zone itself divides into two main parts—the hilly regions of the west, which include tertiary folding and wide open valleys and plateaus, and the main alluvial valley of the Indus, which mostly stretches to the east of the river. The zone itself breaks into minor geographical and geological divisions. The first is the Peshawar plain consisting mainly of the valley of the river Kabul, a tributary of the Indus, surrounded ringwise by hills with a gap only towards the mouth of the Kabul. The valley incorporates much of older and newer alluvia while the foothills preserve many pleistocene beds (Spate 1954: 445–48). The second is the Panjab plain which starts with the undulating ground east of the river Indus and merges with the alluvial flat of the five great tributaries of the Indus, that give rise to the terminology of the Panjab, meaning land of the five rivers (五川). It is in the western defiles, locally known as the Salt Range, that sufficient geological studies have been made, and in its smaller area of the Potwar plateau that the Stone Age materials have been examined in relation to the Himalayan glaciation (de Terra and Paterson 1939). The third area is the delta of the Indus, which starts from a point where the desert comes closest to the western hill. This point is the bottleneck between the Panjab plain on the north and the Sind delta on the south.

It is marked by the limestone hills of Sukkur and Rohri, where alone flint and chert are available in large quantities. As a result this place has been the great factory site for the production of blade and flake tools as well as late microlithic implements. It is the worked materials from this place that were moved down into the great protohistoric cities like Mohenjodaro—the type site of the famous Indus Valley civilization of bronze age (Marshall 1931, Mackay 1938). The fourth region is the almost desert-like plateau of Baluchistan separated from Sind by the Kirthar Range. This is an eastward extension of the Iranian plateau. Geologically it is *terra incognita*, but quite a large number of protohistoric sites have been discovered here. They all relate to the cultural phase that links the bronze age civilization of the Indus Valley with those of Iran and Mesopotamia. But under the prevailing geographical conditions the economic level could not rise beyond village communities (Wheeler, 1960: 9–16, calls them 'hill villages').

D. N. Wadia (1928) of the Geological Survey of India was the first man to draw attention to the presence of palæolithic artifacts in the Salt Range. K. R. U. Todd whose materials are kept in the University Museum of Archæology and Ethnology at Cambridge (U.K.) in 1930 discovered a site at Pindigheb near Rawalpindi. In 1932 de Terra, of the Yale North India Expedition, reported a palæolithic find. As a result a joint Yale-Cambridge Expedition went into the field in 1935. The results (de Terra and Paterson 1939) of this expedition are the basic source material for all the studies that have so far been made in the prehistory of Pakistan. V. D. Krishnasvamy (1947) of the Indian Archæological department surveyed this material for the first time in the general background of Indian prehistory. H. L. Movius Jr (1948) reviewed the entire material in the light of the palæolithic cultures of Southern and Eastern Asia and suggested a new terminology for the tool types. Recently Paterson, one of the participants of the Yale-Cambridge Expedition, has come out with a new study entitled *SOAN, The Palæolithic Pakistan*. The book is published by the Department of Archæology, Government of Pakistan.

The palæolithic complex discovered by the Yale-Cambridge Expedition has been generally termed Soan (Sohan) valley culture, the term being first proposed by Paterson. It originates from the name of a small river Soan, a tributary of the Indus, which provided the main source material for the study of the archæological data in relation to different terraces of the river. In all, five terraces have been generalized. A direct connection is supposed to have been established between the boulder conglomerate of the Potwar and the outwash of the second glaciation of the Himalayan mountains. An earlier conglomerate was found to correspond with the first glaciation and, by continuous tracing mountainward, a series of terraces was correlated with the later interglacial and glacial phases. The pleistocene in the Potwar region is mainly divided into three periods: lower, middle and upper. It is in the boulder conglomerate of the second glaciation that the earliest tools of this region have been found. These early implements have been significantly called 'Pre-Soan' as they do not correspond with the dominant characteristic of the Soan culture. The pre-Soan tools are big flakes or split pebbles of quartzite with unfaceted striking platforms mostly at obtuse angles. They are heavily worn. Following this phase of the second glaciation there was a prolonged second interglacial phase which was redeposited on Terrace 1. It is here that we find the typical 'Soan' industries. The 'Early Soan' is a pebble and flake industry consisting mainly of chopping and scraping tools, which are further classified by Paterson on the basis of available shapes. The flake tools include both high-angled Clactonian types as well as low-angled Levalloisian examples. Along with them have been placed a few ovate types of hand-axes. During the succeeding glaciation Terrace 2 was formed in a process of aggradation making two deposits—the basal gravel containing the pebble industry of the earlier phase showing both unifacial as well as bifacial cutting edge, and the upper loess consisting mainly of Late Levalloisian flakes. The materials of this terrace are generally referred to as 'Late Soan'. The evolution of the tools can be summarized in the words of the authors: 'the presence of the large number of pebble tools and cores made on small pebbles is one of the most outstanding features of the Panjab . . . in the Soan pebble tools there can be traced a development towards smaller and more finely made types. The Soan flake industries, too, provide an excellent example of the evolution of a flake culture in a small area. In the early stages the flakes are crude . . in the late Soan, alongside the simple forms, there are other flakes, showing a development in technique, with much more regular primary flaking and often with faceted platforms, denoting careful preparation of the core in a manner reminiscent of the Levalloisian' (de Terra and Paterson 1939: 311–12). In the final stage of terraces 3 and 4 a new stone industry of blade-flakes and scrapers was recognized. This was termed 'proto-neolith' by the authors. Recently they have been included under the category of Indian Middle Stone Age industries (Subbarao 1959, Allchin 1959).

The Late Stone Age materials have been found occasionally in Pakistan. De Terra and Paterson have reported stray finds of microliths in the Panjab, but the tools found by them at Uchali west of Naushehra in the Salt Range have not been described (Gordon 1958: 21). The most important source material is the Sukkur and Rohri limestone hills, where long chert cores, six by two and half inches long, have been found. It is again here that long ribbon flakes were originally made and transported to other sites. These flakes have been traced in a number of sites in Sind (*ibid.*: 19: 21; also in *Man* 1938). Gordon (1958: 19) has also reported microlithic finds in the vicinity of Taxila and Rawalpindi; but he is certainly wrong when he talks of Jamalgarhi cave. There is no cave near the Buddhist ruins at Jamalgarhi. The nearest cave traceable is situated about two miles away from Jamalgarhi on way to the rock-cut Buddhist cave of Kashmir-smast. It is here that we find the microlithic finds talked of by Gordon. This find is not an isolated phenomenon in this region.

The survey conducted by the University of Peshawar this year has brought to light many sites in the open plain and at the foot of the hills that separate Buner from the district of Mardan. The plain shows the reddish loamy soil washed down from the hills. It is here that the microlith using men moved about with their arrows and bows hunting wild game. Far away, right at the foot of the hill, is the village of Sanghao (meaning a Buddhist monastery 僧房). The village is situated at the mouth of a valley enclosed all round by a ring of hills. This valley is further subdivided into smaller valleys by spurs jutting out from the main tertiary hill. In these smaller valleys springs are abundant, and in the past each one of them supported human habitation. All over the valleys Buddhist ruins are scattered far and wide. In several of the smaller valleys ancient caves are extant. One such valley is named Parkho-darra which has a very big cave, about 100 feet long and 30 feet deep. It is a natural cave formed by weathering and disintegration of the original conglomerate rock that makes up the spur. It is in this cave that this season's work was concentrated.

The present floor of the cave is 5 feet higher than the ground level, and its ceiling is coated with thick black soot. The approach to the cave is sloping and this slope makes a rough embankment of carelessly packed stones collected together at different times obviously to protect the inside from occasional flood rains. With the object of revealing the cultural deposit a long trench 50 feet long by 10 feet wide was laid in the middle of the cave. The excavation was carried to the rock bottom which roughly averaged between 12 to 15 feet from the top surface. Four main periods were revealed in the excavation. The top two layers belonged to the Buddhist period datable by the discovery of a Kushana coin of the 1st century A.D. and a single sherd of Northern Black Polished ware which may be placed in 3rd century B.C. in this context. The occupation layers show an irregular habitation in several pits of charcoal and ash full of potsherds, bones and other sundries. It is in this period as well that the pitching of the embankment was mainly done. But the next early period is known from the material mixed up with the embanked stones and one or two pits. It is here that we get for the first time in West Pakistan neolithic tools of an advanced character—tools which are partly made by grinding and partly by rough battering. Among them we clearly recognize rounded hammerstones of granite, maceheads, spearheads, meat choppers, wood-cutting axes or wedges and hoes of two types: *(a)* curvilinear longish type, and *(b)* shouldered tool type. The last type is for the first time discovered in this region. All these types are also found scattered in the terraced fields in the whole valley as well as across the hill in Buner, lower Swat and Dir. At a place near Thana in Malakand Agency and another near Timurgarha in Dir these tool types have been collected in large numbers. It is strange that among them we have not discovered a single example of the well-known pointed butt type of the Indian ground axe. The neolithic tools so far found all copy metal types, and though the older chipping technique is preserved in some of them chronologically they do not appear to be very early. If the tool types are at all indicative, it seems that this region was a backward area and continued to produce food by using these stone tools which are based on metal forms probably at a time when other regions were beginning to use metals; a detailed account will be given in a forthcoming publication on *Sanghao Cave* by the University of Peshawar.

The main deposit in the cave belongs to *(i)* the microlithic period which started immediately below the embankment; and *(ii)* middle stone age, which continued to the rock bottom showing ten different layers of occupation. As was expected in a cave dwelling, these layers do not make floor levels but they represent different stages of occupation accompanied by masses of ashes and charcoal deposit. All these layers form at an acute-angled incline from the back rock of the cave, beyond which lie the thrown-off spoils. Through all these ten layers we can trace the evolution of the tools and study carefully their manufacture in the waste material that was thrown near about in the cave as well as in the rubbish deposit outside. The main material used is quartz which is available as outcrops in the local hills. Sometimes white crystalline quartz is also found. A few tools are also made of bluish silicate lime stone and some of bone. The microliths are completely different from those found in Sind. In character they can be described as completely non-geometric. We have not found a single example of crescent, trapeze or parallel-sided blades. The predominant types are three: different varieties of scrapers, points of various types, and triangles, some of which are perfect arrowheads. Some of the scrapers may be classified as knives with blunted back. Even now they are so sharp that several students got their fingers cut. They vary in size from three-fourths of an inch to two inches long and show fine secondary retouch at the edges. Many of them show marks of use. These people were, no doubt, hunting game in the valley. The excavation produced three horns of wild goat and many bones.

These people were the earliest to occupy the cave soon after its formation. The approximate date of the cave formation can be fairly well deduced. The layers which are seen in the cave stop immediately at the point where the cave ends, and below the rubbish pit there is a clear line of break, beyond which the layers outside the cave are entirely different from those within. Outside we have not been able to trace any charcoal or ashy layer in the lower levels. On the other hand we find solid red loamy soil apparently deposited by the washing down of the hills. It is on the top of the red loamy soil that the microlithic people came to live. Outside in the open plain their implements are scattered over the same soil. But below this level the soil makes two clear deposits of compact earth containing altogether different materials. Here again the raw material is the same quartz, but the size of the tools is astonishingly large and under no circumstance can they be included under the term microlith. The types are also entirely different. We find here rough triangles, awles and large size scrapers. Only one example of an arrowhead(?), four times the size of an ordinary microlith, was found. These tools do not show such fine workmanship as is the case with the microliths. Though no long blades or chopping tools have been found here, I am inclined to classify them as upper palæolithic (middle stone age) artifacts stratigraphically distinguished from the later microlithic tools. None of this type is found within the cave. Obviously the upper palæolithic man lived in and outside the cave. Here then we have the first important evidence of two clear periods of deposit—one before the formation of the cave (which remains to be excavated) and the other after the formation of the cave—distinguishable stratigraphically as well as culturally.

The rock bottom of the cave is a very irregular formation showing huge boulders here and there. On breaking deliberately some of the boulders two good specimens of middle Acheulean hand-axes were recovered. This find suggests that the conglomerate belongs to the middle pleistocene period. Thus the first season's work at Sanghao has brought before us a complete picture of the prehistory of Pakistan. The excavated materials are yet to be studied in detail, and more explorations have to be done in the neighbouring areas before these tentative conclusions are finally confirmed.

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7

Prehistoric Archæology in Ceylon

P. E. P. DERANIYAGALA

It was in 1908 that the Sarasins discovered the existence of a stone age in Ceylon. Other workers such as the Seligmans (1911), Hartley (1913) and Wayland (1919) followed, but it was not possible to formulate a chronological sequence with any semblance of accuracy since the bulk of the material collected was picked up from the surface and vertebrate fossils from the Island were unknown.

In 1935 an extension of the extinct Shivalik [Shiwalik] fauna of India was discovered in Ceylon, and termed the extinct Ratnapura fauna (Deraniyagala 1936; pl. 1). This opened up possibilities for a great advance on the existing methods of age determination of the Island's prehistoric industries, but the subsequent discovery that the fossils were mostly redeposited ones (Deraniyagala 1955*a*) has proved an impediment.

Before discussing the stone age of Ceylon further, it is necessary to realize that this Island harbours several relics of both beasts and humans which had originally ranged widely over the Indian subcontinent. For example, the southern limit of the extinct hippopotamus in India is the Godavari river; thereafter it recurs in Ceylon (Deraniyagala 1936). Similarly a subphase of the Suwan (= Sohan) stone industry which at the time was only known from Northwest India was found to possess a closely allied, if not, identical subphase in Ceylon (Deraniyagala 1940*a*).

Nothing was known about the makers of these artifacts for many years and it is interesting to note that although India contains such extensive fossil deposits, authentic hominid fossils were unknown not only from there but from Burma as well (Sahni 1956).

In 1957 however the completely mineralized thick, left, supra orbital ridge of a hominid was recovered from the gem sand of a gem pit at Karangoda at a depth of 12½ feet. With it were fossils of Ceylon's extinct hippopotamus and elephant. This extinct human has been named *Homo sinhaleyus* Deraniyagala 1957.

Two years later the crown of a large, left upper incisor tooth, 16 mm. long and 15 mm. wide, of a pithecanthropid was obtained from a gem pit at Balahapuva near Ratnapura. With it were fossils of hippopotamus, rhinoceros, elephant and bovines and also a scraper of rock crystal. The name *Homopithecus sinhaleyus* has been assigned to this being (Deraniyagala 1963*a*). Both holotypes are in the Ratnapura Museum.

The oldest stone implements of Ceylon might be the handiwork of either one or both of these hominoids but until more material is discovered *in situ*, no further view is possible. A tentative chronology can be erected by correlating the most archaic types of stone implements which belong to the Ratnapura industry with the earliest species of mammals of the extinct Ratnapura fauna (Pl. II).

The artifacts of the first subphase of the Ratnapura industry are difficult to distinguish from naturally fractured stones, but the second possesses artifacts akin to the early Suwan [or Sohan] of India, while in the third subphase choppers and cleavers are common, Abbevilleo-Acheulian type hand-axes are rare, and Levalloisian type artifacts also occur (Pl. II).

Of younger age is the meso-neolithic Balangoda industry in which the associated animal remains belong to recent species. Among its stone implements are pygmy semilunates, hammer pebbles both unpitted and pitted, tranchets, adzes, an occasional hand-axe, burins and mace heads or spindle whorls with bifacial drilling.

Some of these reveal that the art of grinding and polishing stone implements was known but had not progressed very far (Deraniyagala 1942*a*). The type collections are in the Colombo and Ratnapura Museums of Ceylon (Deraniyagala 1953). As these humans had used simultaneously stone implements of palæolithic, mesolithic and neolithic types which at times occurred with potsherds (Deraniyagala 1958 *a*, *b*), it is not improbable that this group had been in Ceylon since palæolithic times and gradually evolved the more modern types of implements without completely discarding their original palæolithic ones. It might also be the case that a palæolithic people had originally inhabited Ceylon. Subsequently, humans in a meso-neolithic culture phase using crescentic microliths had entered the Island from India, and the two groups had hybridized. The ancient references to the existence of several barbaric groups termed Yakkas, Nagas, different tribes of Väddas and the naked Nittayo, when correlated to the evidence supplied by the different types of stone implements, supports such a view.

These extinct humans are named *Homo sapiens balangodensis* and were first known from a frontal bone and a well worn last molar from Ravan Ella cave, later from other caves at Kuruvita and Telulla (Deraniyagala 1955*b*) and finally from a kitchen midden cum burial mound at Bellan Bändi Pälässa which yielded skeletal remains of ten individuals some of which were fragmentary. All were in flexed postures and in association with a wealth of stone, bone and antler artifacts (Deraniyagala 1957, 1958*a*, 1963).

The skeletal remains of this group were always discovered in association with hammer pebbles (Pl. III *a*) which were frequently pitted at the short axis, pitted anvil cum grindstones (Pl. III *b*), other stone and bone artifacts and the remains of the various animals they had utilized as food (Deraniyagala 1957).

The first major discovery at the open air site at Bellan Bändi Pälässa revealed that at times potsherds also occurred with the other artifacts (Deraniyagala 1960, 1963). This site has yielded a greater and more varied assortment of bone implements than any corresponding one in India. Some were hand-axes manufactured from slabs extracted from the leg bones of elephants (Pl. III *c*), others were daggers or celts made by removing the brow tine from a sambhur antler, then splitting the beam and trimming it into a triangular blade, leaving the burr of the antler at the posterior of the handle (Pl. III *c*).

These humans were dolichocephalic, with diffuse thick brow-ridges in the males and with the third molars well worn through usage (Pl. I *c*). Some males revealed a strikingly great distance from the nariale to the prosthion (Pl. I *b*) and a considerable portion of the occipital bone is visible in norma verticalis.

Since the publication of these descriptions, Dr Kenneth Oakley of the British Museum wrote to the Government of Ceylon requesting the loan of the skeletal material for intensive study by Dr K. Kennedy of the University of California and by the officers of the British Museum. The request was granted and the results of this study are being published by the British Museum.

Meanwhile, another skeleton of a 17-year old individual was secured and this, together with the skeleton of an adult male, were worked out by the present writer and the results are in *Spolia Zeylanica*, **30**(1), 1963.

Other work in prehistory consisted of sending out Museum field parties to excavate trial trenches. Those which yielded animal remains and stone artifacts and appear to be worth detailed excavation are as follows:

Year: 1961—Mālena at Gavaragiriya.
1962—*a*. A rock shelter in Kongala forest near Deniyaya.
b. Belilena rock shelter near Kitulgala.
c. Dahiya lena rock shelter at Batatota, Kuruvita.

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1958*b* The persistence of palæolithic types among the stone artifacts of Ceylon, *Indian Science Congress Association Proceedings*, 46th Session at Delhi, pt. III. Abstracts: Section Archæology, p. 433, No. 38.

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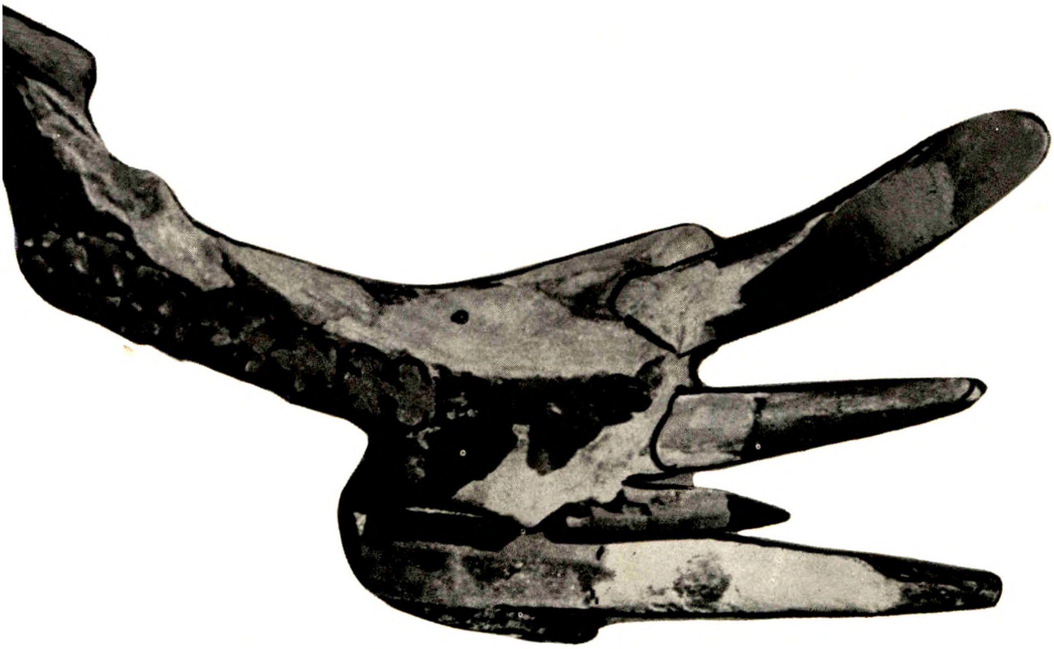
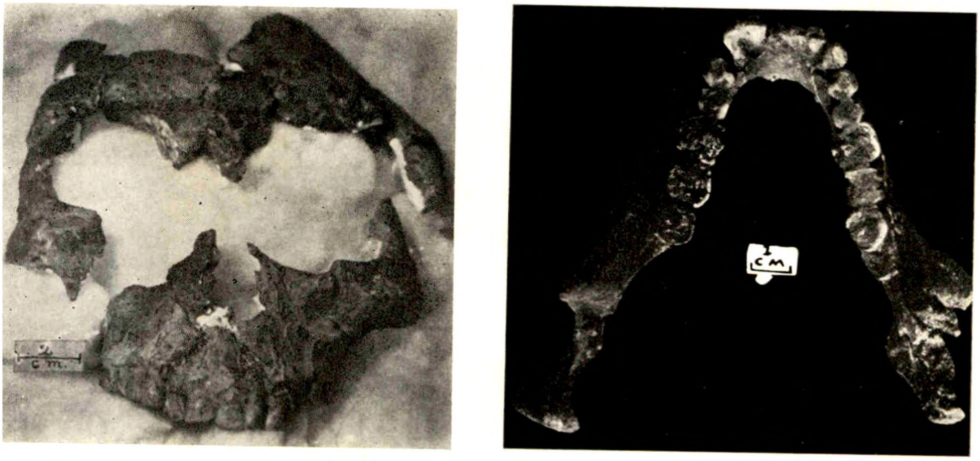
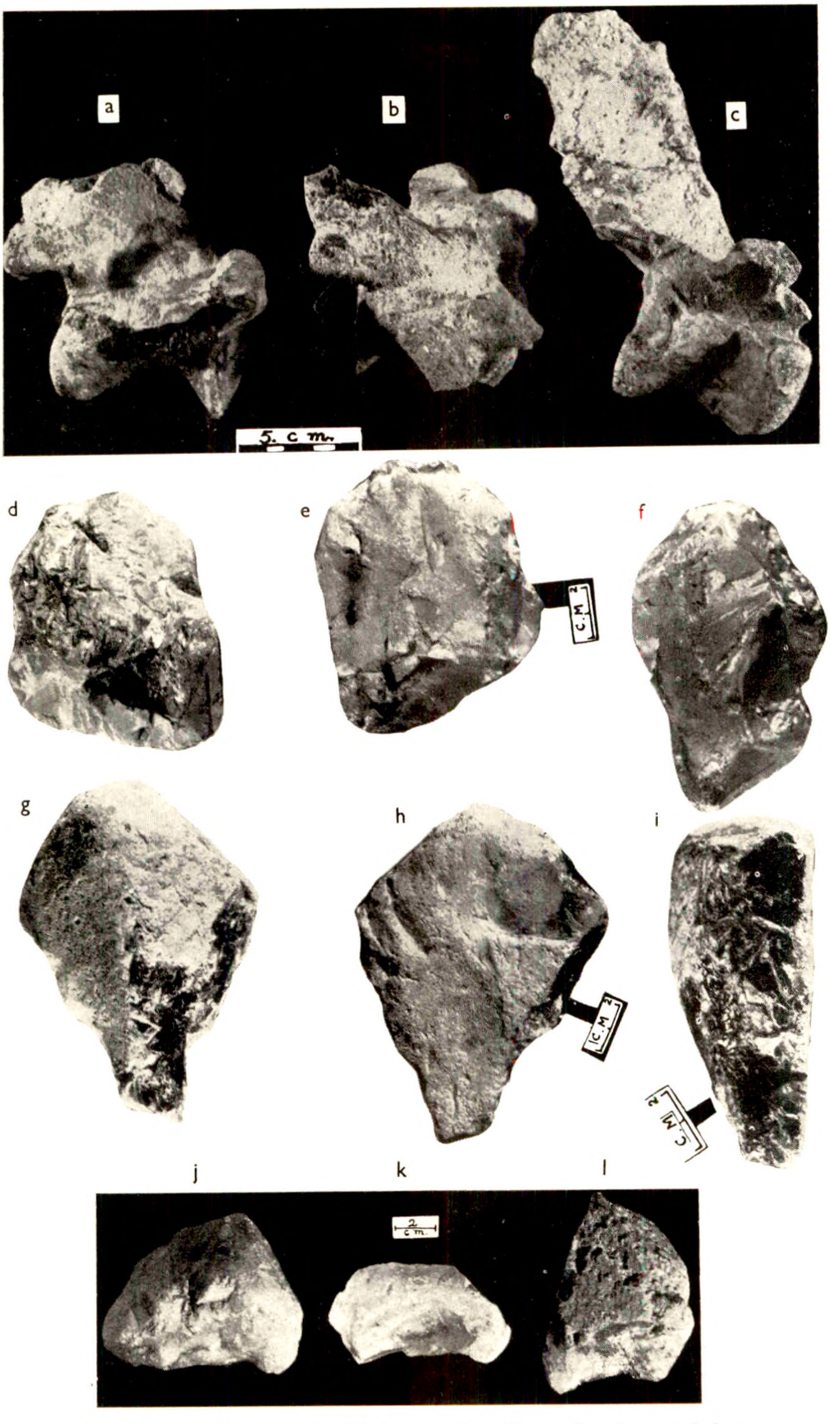


a. The occlusal view of the left mandibular ramus of Ceylon's extinct hippopotamus *Hexaprotodon sinhaleyus* Deraniyagala. The specimen was dug up at Ellavala. Note the reduction of the 2nd and the partial reduction of the 1st incisors.



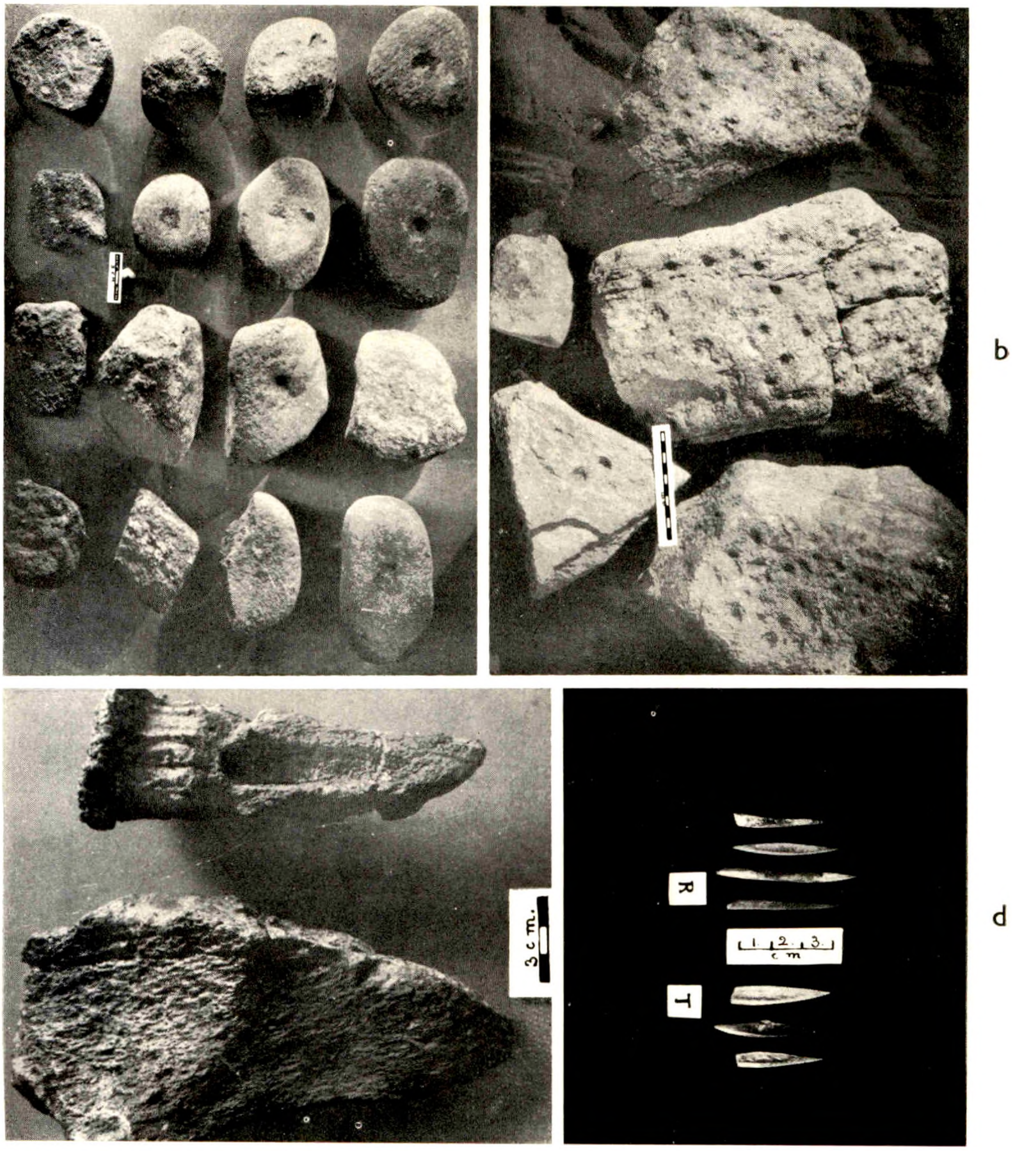
b. The face of an adult *Homo sapiens balangodensis* dug up at Bellan Bändi Pälässa. Note the great distance from nariale to prosthion and subequal incisors.

c. An occlusal view of the mandible of fig. *b.* Note its subrectangular shape and also the well worn third molars.



Vertebrae of *Hexaprotodon sinhaleyus* and artifacts of rock crystal dug up from gem pits in Sabaragamuva Province.

a. b. c. Vertebrae of *Hexaprotodon sinhaleyus* from Koravak vila, Kuruvita.
d. e. f. Three aspects of a chopper or cleaver from Ähäliyagoda.
g. h. i. Three aspects of a hand axe from Karapincha.
j. A concave scraper from Koravak vila.
k. l. ditto from Ähäliyagoda.



Artifacts of *Homo sapiens balangodensis* Deraniyagala

a. Pitted hammer pebbles and bark pounders dug up from Kabara galgé (rock shelter) Kakule, Hangamuva.

b. Pitted anvil cum grind stones from the same site.

c. An amygdaloid hand-axe of elephant bone and a celt of sambhur antler from Bellan Bändi Pälässa.

d. Bone(?) blow pipe darts or arrowheads: R = from Ravan ella cave; T = from Tellula cave.

Special Taiwan Section

Guest Editor

KWANG-CHIH CHANG

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I

Introduction

KWANG-CHIH CHANG

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Rather than summarize what is known about the prehistory of Taiwan, the articles in this special section of *Asian Perspectives* VII—devoted exclusively to the prehistory of Formosa—seek to elucidate the various aspects of the study of its prehistory, their outstanding problems, and the possible approaches. In the prehistory of the Far East, the island of Taiwan holds many keys if its importance is recognized and its potential clues are fully explored. The authors and the editor of this section hope to make prehistorians interested in the Far East well aware of this, and to suggest to them further means of exploration.

Prehistoric archæology began on the island of Taiwan in 1896 (Kanaseki 1943: 1–16; Kano 1946), the second year of Japanese occupation, but professional and scientific work was marked by two events in the history of the National University at Taipei—the first was the establishment of a Chair of Ethnology at the Imperial Taihoku University in 1928, whose first and only occupant was Professor Utsurikawa Nenozo; the second event was the founding of the Department of Archæology and Anthropology under the College of Arts at the National Taiwan University in 1949 by Professor Li Chi. Under this stimulus of concentrated efforts in prehistoric studies at the intellectual centre of the island, historians, geologists, and amateur archæologists have been carrying out, at various places throughout the island, archæological investigations on varying scales, either as interested individuals or under the auspices of colleges, schools, museums, or the provincial and local Commissions for Historic Research. During the nearly seventy years since 1896, considerable data have been accumulated, with research directed toward the following three aims: *(a)* the grouping of archæological assemblages under a time-space framework; *(b)* the reconstruction of the culture and society of prehistoric peoples in various periods and regions of the island; and *(c)* the comparisons of the island's prehistoric cultures and cultural elements with those in the adjacent areas of the Far East to determine their historic relationships.

Up to this date, several hundred prehistoric sites have been found on the island, but full-scale diggings of sites *in toto* or in appreciable part are few, and among them stratified sites are even fewer. For this reason and also because perishable elements of prehistoric cultural inventories are seldom preserved at the sites (owing to the damp, warm climate of the island), the cultural groupings are in most cases based exclusively upon the colours, pastes, shapes, and surface treatments of pottery or the shapes of stone axes; and chronological studies in the majority of cases have been made on typological and/or distributional grounds. Island-wide syntheses of the time-space framework of Taiwan prehistory have been attempted, however, by Tadao Kano (1952) and myself (Chang 1954, 1956), but we still have a long way to go before the first aim of prehistoric research given above is satisfactorily achieved.

The Tap'enk'eng site excavated in 1962–63, a preliminaryre port of which by Liu Pin-hsiung appears in this issue, is thus of the utmost importance, for at this site no less than five different cultural phases are found in stratified relationship. Besides this site, a few others are also of stratigraphical significance, and have been excavated to varying extents (Chang 1956: 376–379). Based on the information obtained from them, a preliminary framework of the prehistoric cultures along the west coast can be reconstructed; but a chronological alignment of many known sites on the eastern coast and in the central mountainous regions of the island remains to be formulated. When we turn our attention to the problems of absolute chronology, the island's prehistory yields practically nothing. Estimates as to dates before the historic period beginning in the 15th-16th centuries can only be made by the horizon markers dated from other parts of China and Southeast Asia—needless to say, they are always suspect. Radiocarbon dating facilities should be available to the archæologists on the island; for it is a pity that this relatively simple and highly reliable technique has been so far used for no more than two archæological samples of whatever age from the entire area of China (Jelinek 1962: 475), and even these two samples were of questionable provenance.

The second line of research (to reconstruct prehistoric life on the island) has suffered from the small number of fully excavated sites and that natural scientists have been here of little assistance to their archæological colleagues. However, abundant evidence of the prehistoric stone, bone, and ceramic technologies has been brought to light, and the hunting methods and the varieties of animals hunted and the mollusc-shellfish collected are known at a number of sites. Burial customs have been postulated wherever burials are found. But the generally small scale of excavations inevitably overlooked information on architecture, settlement patterns, and the social aspects of prehistoric life. Pollen analysis has never been applied and, except for one instance where an impression of millet reed on pottery was recognized (Liu 1955: 69–83), the agricultural aspects have not been determined significantly beyond the description of farming implements. The archæologists by themselves cannot deal with most of these inadequacies; and in many instances only substantial assistance from natural scientists will lead to fruitful results. We in the archæological camp are therefore grateful to Professor Lin Chao-chi of the Department of Geology, National Taiwan University, for his study of the prehistoric environment in this issue. As an active field geologist and palæontologist, Professor Lin, in the course of the past decade or so, besides helping the archæologists with geomorphological observations and zoological identifications at prehistoric sites, has discovered many such sites himself, among which is the important Shihsanhang site described in Liu's article.

My colleagues will probably agree with me that up to now the most fruitful area of research in the prehistory of Taiwan has been in comparing the archæological materials from Formosa with those of adjacent regions to determine their historic connections or other relationships. This, of course, is not accidental. Since Taiwan is an island separated from the nearest land mass by over a hundred miles of water, it is a rather well-defined unit by itself and a convenient starting point for comparison. Many persons with a professional interest in the island's prehistory are, furthermore, scholars without narrowly confined perspectives. Kanaseki, Li Chi, and Shih Chang-ju, for example, bring in their intimate knowledge of Chinese archæology, and Kano Tadao was a geographer widely informed on the ethnography of Southeast Asia. When such scholars focus their attention on Formosa as a well-delineated and geographically isolated unit, they find that the island had never been really isolated in cultural history.

A primary reason of the interest of Taiwan among the prehistorians of the Far East (enough to warrant a special section on Formosa in *Asian Perspectives*) is that Taiwan is archæologically of great importance for data on the historic relationships between the mainland of East Asia and the islands of the Western Pacific. It is unique in that it is probably the only place where studies of such relationships can be undertaken both archæologically and ethnologically. In other words, it is the only existent link of significant substance between the ethnology of the Pacific and the archæology of the mainland mass. It is close enough to the mainland to have close historic ties with it, but isolated enough from it so that remnants of the ancient ties are still found ethnologically today, whereas the entire southeastern coastal area of South China has long since become totally sinicized. Finally, Taiwan is the only outpost of the Western Pacific cultures along the entire southeastern Asiatic island arc, that is close enough to the mainland, to have served as a most convenient stepping-stone of ethnic and cultural movements in both directions—as long as such movements are postulated.

Available archæological evidence indicates that the external connections of the prehistoric cultures on Formosa lie mainly in two directions: mainland East Asia (South China and Indochina), and the islands to the south and the southeast (Malaysia in the ethnological sense, Melanesia, Micronesia, and Polynesia). Since connections with the Ryūkyūs and with Kyūshū have not been extensively studied, Kokubu's paper in this issue is a pioneer effort which contains several interesting and instructive ideas.

Formosa and mainland East Asia similarities in prehistoric inventories of material culture have long been noted by archæologists, and Kano (1952: 181), in his posthumously published synthesis of Taiwan prehistory, was confident that: 'The substratum of prehistoric cultures on Taiwan was the prehistoric culture on the Chinese mainland, which radiated into Taiwan in several waves. Subsequent to this was the eneolithic culture from Indochina with both bronze and iron. The uppermost layer consists of iron cultures (without bronzes) introduced from the Philippines'.

This Mainland-Taiwan relationship today we know better than a decade ago and have a clearer idea about the west coastal cultural sequence on the island largely, I believe, because the prehistoric cultures on the southeastern coasts of China are better known today. My own paper in this issue on the ceramic horizons of Southeastern China sums up our current knowledge of the subject. It is now solidly established insofar as the western coast of the island is concerned, that *(a)* its prehistoric cultural phases have as many horizons as there are on the opposite coasts of mainland China, and *(b)* each ceramic horizon of Taiwan is a local facies of a corresponding and identical horizon of the South China coast.

In terms of the movement of people and cultures across the Formosa Strait, two alternative interpretations immediately present themselves. Either the mainland cultures penetrated the island and were diffused among the aborigines who, before the penetration took place, possessed cultures of their own; or the mainland cultures were brought in by immigrants. A combination of these two alternatives is also possible. In his *Inference of Migrations from Anthropological Evidence*, Irving Rouse (1958: 64) suggests that 'it is necessary to do five things in order to demonstrate adequately that a migration has taken place: (1) identify the migrating people as an intrusive unit in the region it has penetrated; (2) trace this unit back to its homeland; (3) determine that all occurrences of the unit are contemporaneous; (4) establish the existence of favorable conditions for migration; and (5) demonstrate that some other hypothesis, such as independent invention or diffusion of traits, does not better fit the facts of the situation'. When these criteria are applied to the archæological facts of the west coast of Formosa, all five of these conditions are satisfactorily met for all three of the ceramic horizons. The Corded Ware Horizon was probably brought over from Southwest China and Indochina along the southern coast of South China by migrants, unless evidence unavailable at present was to show that the island was occupied by preceramic or even palæolithic inhabitants. The Lungshanoid Horizon sites on the island are few and far between, apparently intrusive units from the Lungshanoid Horizon that has been well established for the coastal areas of South China. The intensity of the Geometric Horizon sites markedly increased on the western coast, an increase that appears to correspond to the more intensive occupation of the South China coasts by the Geometric cultures.

After the Geometric Horizon was replaced on the mainland by the Eastern Chou and the Han Horizons successively, the island of Formosa became, for reasons that are yet to be accounted for, increasingly isolated from South China until the historic period, and any post-Geometric Horizonmarkers that are found at scattered spots on Formosa, such as the Dongson-like bronze artifacts (Kano 1946: 198–214), must then be regarded as intrusive single traits of culture. The Geometric Culture appears to have persisted on this island, with varying changes in the various aspects of culture, until the historical period. Both Kano (*ibid.* 161–167) and Miyamoto (1956: 329–334) are strongly for the view that the descendants of prehistoric inhabitants on Formosa account for a substantial percentage of the aboriginal peoples of today—approximately one hundred and fifty thousand souls inhabiting the central mountainous regions and the eastern plains. The Atayal, the Tsou, and the Bunun groups recall the use in former days (during the youth of their elders, about a generation or two ago) of stone axes, hoes, and spearheads. Stone implements and pottery identical with prehistoric finds have been picked up in abandoned settlements of the Tsou, Bunun, and Ami groups. Among several modern groups, menhirs, stone pillars, stone walls, and cist graves are still built in the ethnographic present, identical with or similar to prehistoric discoveries (Kano 1952: 161–167). Though many modern groups have ceased to manufacture pottery, wherever information is available on their pottery making in the ethnographic present, continuities of the prehistoric Geometric Horizon are strongly represented in techniques of manufacture, shape of the vessels, and the surface treatment (Chen 1959, Jen 1960, Shih 1960, Sung 1957).

The relationship of modern aboriginal groups on Taiwan with its prehistoric inhabitants, as pointed out by Kano (1952: 164), is a problem both interesting and complicated. No simplistic generalizations should be attempted before making concentrated efforts on research in this direction. An undertaking of great urgency would be to trace the routes of inland migrations of the various modern ethnic groups on the island, with all the historical methods at our disposal, and to identify the former settlement sites of each group along the general areas of such routes (e.g. Mabuchi 1953–4). Specific connections may eventually be pinned down between individual ethnic groups of today and the prehistoric cultural phases of various periods. Before this is done we must be satisfied with the broad observations of Kano and Miyamoto that there *are* continuities from the prehistoric to the ethnographic. If we accept this as valid—and I see no reason for questioning it—we have to conclude that at least a substantial part of the modern aborigines on the island of Taiwan descended from prehistoric ancestors who entered the island from mainland China. Since the modern aborigines all speak the same language (Malayo-Polynesian) and have the same culture (Malaysian), any continuity in part poses the same problems as continuity *in toto*. We therefore face the problem of the ethnic identities of the ancient peoples on the mainland.

In this respect both Kano Tadao and Ling Shun-sheng in the early 1950's independently came to the conclusion that in South China there was an ancient Malaysian cultural substratum before the arrival of the historical Chinese civilization, and that the modern Malaysian culture on the island of Taiwan originated in that direction. Kano has compared 73 items in the material culture of the modern aborigines, ranging from agricultural crops to musical instruments, with analogous items on the mainland and in the South Seas, and concludes that 'the aboriginal Formosan culture is largely connected with the mainland, a fact that is somewhat unexpected' (Kano 1952: 243). He further states,

> It has been mentioned above that most of the material culture traits among the Formosan aborigines are related to the mainland. There are some among those traits that have been considered that are affiliated with the South Seas, but their distributions are mostly confined to the Botel Tobago Island and the eastern coast. These facts present undeniable parallels to the conclusions reached by prehistoric studies. In other words, the prehistoric cultures of Taiwan, on the whole, are related to the mainland cultures, but closer examinations reveal that the West Coast exhibits heavy Southern Chinese colours, whereas the eastern coast is connected with southern Indochina with reference to the megalithic cultures. In addition, the Iron Age cultures of the Philippines also intruded into the east coast. As to the Botel Tobago Island, its prehistoric cultures belonged to the Philippine sphere (*Ibid.* 246–247).

Ling Shun-sheng (1950–1956), in a series of articles, has sought to demonstrate by historic documents and comparative ethnology that the aboriginal cultures in South China before the introduction of northern Chinese civilizations were 'Malaysian' in affiliation. With the advance of Sino-Tibetans in South China, he thinks, the Malaysian cultures gradually disappeared from the mainland of China, although fragmentary documents of their aboriginal cultures appeared in historic records of various ages; and remnants of this archaic cultural substratum still survive in outposts such as Assam in the west and Formosa in the east. The majority of the Malaysian cultures are found today in the ethnological Malaysia.

The hypotheses of Ling and Kano deserve serious study on the strength of the evidence they have marshalled, and our growing knowledge of the archæology of South China appears to give support to them in their broad outlines. I am convinced that recent advances on all fronts in the cultural history of Southeast Asia, particularly South China, agree in rendering very likely the view that the cultivation of cereals; the making and use of polished stone implements; and the making and use of pottery in the Western Pacific came from South China; and that the Formosan natives of today are representative of this archaic cultural substratum preserved in Taiwan in the course of the culture's movements into the South Seas (Chang 1959, 1962). Solheim in this issue has made use of the available evidence to assess the Taiwan-Southeast Asia relationships, and his conclusions are essentially in agreement with the above view. Migrations and diffusions in the reverse direction are obvious, as is shown by some of the prehistoric and ethnographic evidence from the eastern coast and from the southern end of the island. But the general direction of ethnic movements has been, as has been postulated for many decades, from the west to the east, from the mainland to the islands. There are many ethnological similarities between the Formosan aboriginal cultures and the native cultures of Southeast Asia. These similarities should no longer be interpreted to support the sometime-held theory that the aboriginal population of Taiwan came, as a body, from the south.

There are complications, however, and these must be resolved, if my thesis here is to be accepted as historically valid. Paramount among these complications lies in the realm of linguistics. First of all, if the neolithic cultures in Southeast China, including those on the island of Taiwan, were ancestral to the modern aboriginal cultures of Taiwan, does this mean that the neolithic peoples in Southeast China were 'Malayo-Polynesians', as suggested by a number of the older linguists? Archæological studies of China have begun to demonstrate that the Southeastern neolithic cultures were extensions of the neolithic cultures of North China, and the mechanisms for their expansion into Southeast China have been satisfactorily accounted for. There is, furthermore, no question whatsoever that the historical Shang civilization was an immediate continuation of the Northern Chinese neolithic cultures (Chang 1963). Does this mean that the Northern Chinese neolithic peoples were ancestral to both the modern Sino-Tibetans and the modern Malayo-Polynesians? I have posed these questions before (Chang 1959), and would like to ask them again. I should like to ask my linguistic colleagues whether it is at all possible that such divergent languages as Sino-Tibetan and Malayo-Polynesian could have become differentiated from a common ancestral stock within seven, eight, or nine thousand years? It is beyond question that the Lungshanoid is a key horizon that establishes archæologically without serious problem the connection among North China, Southeast China, and the island of Taiwan. If linguists give a negative answer to the question above, then we must re-examine our evidence very carefully and make very clear distinctions among such concepts as 'peoples', 'cultures', 'ethnic groups', and the like. An affirmative answer would facilitate our interpretations materially, of course.

In this connection, Professor Isidore Dyen's contribution to this issue is of importance, not merely in terms of the cultural history of the Far East but also in the strategy and tactics of cultural historic studies in general. Recent studies of the Malayo-Polynesian languages by several linguists practically agree in showing that this linguistic family originated and began to disperse somewhere in the Pacific, (e.g. Grace 1961: 359–368); and Dyen's article here forcefully argues against the traditional theory that the homeland of the Malayo-Polynesian family was in mainland Asia, Formosa included. The opinion of such a respected linguist as Dyen commands our close attention and forces us to examine our own premises in every detail, premises that have led to historic inferences very much at odds with the linguistic findings. The problem of Malayo-Polynesian migrations demands careful thinking in the realms of culture, race, and language. Any sweeping conclusions reached by archæology alone, no matter how satisfactory they may appear, cannot be accepted with complacency. The same remark applies to physical anthropological, ethnological, and linguistic studies.

But it is clear that in further investigations of these various problems the archæology of Taiwan will play a vital role. The internal framework of time-space relationships of prehistoric cultures on Formosa is of interest and great significance in its own right. To the readers of *Asian Perspectives,* Formosa offers potential resources with a bearing upon the entire cultural history of the Western Pacific. The exploration of such resources demands vigorous efforts with an interdisciplinary orientation.

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2

Geology and Ecology of Taiwan Prehistory

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QUATERNARY SYSTEM IN TAIWAN

Quaternary formations are scattered on Taiwan island and its satellite islets and can be grouped into three classes according to their origins and morphologies; *(a)* terrestrial facies; *(b)* marine facies; and *(c)* igneous and pyroclastic rocks. Among these, the terrestrial facies which is largely confined to the interior of Taiwan island and its coastal terraces and river banks, is composed of gravels, peats, lateritic soils, sands, and muds. The Huoyenshan conglomerates of the T'ouk'oshan group of the Lower Pleistocene is an exception, however; this is distributed among the hills of western Taiwan to form a peculiar badland topography. Among the marine facies, the T'unghsiao formation of the T'ouk'oshan group is distributed in the hill and terrace area of western Taiwan, on the Pescadores, and in the Taiting coastal range of eastern Taiwan. Later marine facies are located on the coasts of the main island of Taiwan and various islets nearby. The Quaternary igneous rocks and pyroclastic rocks are found on or in the Pescadores, the Tat'un and the Keelung volcanic groups, Ts'aolingshan near Tahsi, Chienshan near Hengch'un, and the Agincort, Crag, Pinnacle, Kuishan, and Small Botel Tobago islets.

QUATERNARY SUBDIVISIONS

The correlation of the Quaternary formations on Taiwan is indicated by Table 1. Accordingly, the Quaternary of Taiwan can be subdivided as follows:

B. Holocene Epoch
  2. Peipinian Age
    b. Anp'ingian Subage
    a. Akungtienian Subage
  1. Hualienian Age

A. Pleistocene Epoch
  5. Milunian Age
  4. T'ainanian Age
  3. Tientzuhuian Age
  2. Tananwanian Age
  1. T'ouk'oshanian Age
    b. Huoyenshanian Subage
    a. T'unghsiaonian Subage

The T'unghsiaonian Subage formations are composed of sandstones, shales, and coral limestones, intercalated with thin layers of conglomerates. In addition to abundant fossils of molluscs, foraminifers, echinoids, bryozoans, corals, etc. from this Subage include stegodons *(Stegodon insignis, S.* cf. *orientalis, S. sinensis)*, elephants *(Elephas trogontherii, E. indicus buski)*, rhinoceri *(R. sinensis, R.* spp.), saber-toothed tigers *(Felix* sp. cf. *Machairodus)*, wild cattle *(Bibos geron, Bibos* sp.), deer [*Cervus (Sika) taiuanus, C. (Deporetia) kazusensis, C.* sp., *Tragoceras* sp.], wild boars, and crocodiles. The mammalian fauna appears to be comparable with the Stegodon-Elephas fauna of South China, and its geological age can be placed from Villafranchian to Cromerian, or the so-called Pre-Glacial Age. The Huoyenshan formations of the Huoyenshanian Subage, of the T'ouk'oshanian Age, are composed of conglomerate strata, 600 to 1,000 metres in thickness, indicating a period of regression and apparently deposited during an orogenic phase. Its geological age can be compared with the Günz Glacial of Europe.

The Tananwanian Age is one of evident transgression, and its formations are composed of coral limestones and sandy-mud layers containing marine fossils of warm-water species. It is probably comparable in geological age with the Günz-Mindel Interglacial.

The Tientzuhuian is the stage of the second major regression in the Quaternary history of Taiwan, during which the shelf of the Formosa Strait lay completely exposed on its surface. It was an extended period of erosions, and the landscape is one of an old stage with low reliefs. The surface formation of this age is completely covered with lateritic soils, which has led Professor Tomita (1940) to refer to it as the Lateritic Hill, or the LH-plane. This feature suggests a probable correlation of this age with the Mindel Glacial of Europe, and it is probable that the laterization of the surface soils was due largely to extreme weathering during the subsequent warm periods.

The T'ainanian is another age of evident transgression; its sediments contain a large number of sands, muds, gravelly muds, and coral limestones mixed with marine fossils of warm-water species. Its geological age should correspond to the Mindel-Riss Interglacial according to its order of appearance. The marine facies of this stage form the higher coastal terraces (LT_1, LT_2, and LT_3). Formations of this age in the interior are of lateritic soil and gravels and are distributed along the banks and near the estuaries of the major rivers.

Disconformity is apparent between the Milunian and the T'ainanian Ages; the basal boulder beds of the Milunian Age (i.e. the Tulanpi boulders) developed above the erosion surface of the preceding age. This erosion surface was probably formed during the regression of the Riss Glacial Age. The corals and the mud and sand beds of the Milunian Age were formed on the Tulanpi boulders, indicating another group of transgressive deposits, probably corresponding in geological age to the Riss-Würm Interglacial. The Milunian terrace covering the Milunian corals is composed largely of gravels, sands, muddy sands, and muds. It includes two or three disconformities, suggesting that within the transgressive Milunian Age there were probably several episodic regressions, which may represent fluctuations of sea levels and are quite similar to those that occurred during the Würm Glacial in Europe. The Milunian formations form the higher coastal terraces, from LT_4 to LT_6, which are on the whole lower than the T'ainanian coastal terraces. At some localities the deposits of both the Milunian and the T'ainanian Ages form a common coastal terrace (e.g. the Milun Terrace near Hualien and the Tulan Terrace near T'aitung); in these cases the T'ainan formation constitutes the bulk of the terrace and the Milun formation covers the surface. The terrestrial facies of the Milunian Age is also composed of laterite-gravel beds which form high terraces (LT_4 to LT_6) along the river banks and the estuaries. The Sungshan formation, in the Salt Lake deposits of the Taipei basin, is composed of muds and sands; and has yielded fossils of marine shells and foraminifers and *Balanus*. The age of its deposition can be placed within both the T'ainanian and the Milunian Ages.

The Hualienian formations (of the Hualien terrace) of Early Holocene are composed of basal gravels, raised coral reefs, coral breccia beds, shells, fossiliferous sands, and gravel beds. The Kunghsia and the Yüanshan shell-mounds of the Taipei basin, the Houlungti shell-mound near Miaoli, the Wanli shell-mound near Tachia, the Fantzuyüan shell-mound at Tachia, the Pakuashan shell-mound at Changhua, the various shell-mounds of the Tahu stage in T'ainan and Kaohsiung, and the shell-mounds at Liangwenkang, Shakang, Ch'ihk'an, and Chukaowan on the Pescadores, all appear to have been formed in the Hualien Age during a period of regression. The terrestrial facies of the Hualienian Age are composed of gravels, sands, and muds, forming the lower terraces of the modern rivers.

The deposits of the Peipinian Age include gravels, shell beds, pumice beds, dune sands, raised coral reefs, raised coral breccia beds, and foraminiferal beds; and recent beach deposits, dune sands, coral reefs, alluvial deposits, and lacustrine deposits. These are distributed near river beds, river banks, coasts, and lakes. The Hsihsinchuangtzu shell-mound in the Taipei basin, the Tap'enk'eng and the Shihsanhang shell-mounds on the southern bank of the Tanshui river, the shell-mound at the Hsinchu city, the Anp'ing jar shell mounds in T'ainan, and the shell-mounds with modern Chinese porcelains on the Pescadores all appear to have been formed during this age.

Evidences of Glaciation

The eustatic movement of the Taiwan Quaternary is probably a glacial eustasy associated with climatic changes, as elsewhere in the world. Major regressions indicate cold glacial periods, whereas major transgressions warm interglacial periods.

The following glacial formations seem to have been left during the Würm Glacial period (probably W4 for the most part, with some traces of W3). Cirque groups, arêtes, terminal moraines, central moraines, Rundhöcker, rocks and gravels with glacial scourings, *roches moutonnées*, Trogschluss, Zungenbecken, Talgletscher, and other glacial formations in the Nanhutashan region (el. 3740·3 m.) of the Backbone Range of Taiwan; cirque groups at Chungyangchienshan (el. 3703·4 m.), Lumoulamolushan (3270·9 m.), Pilushan (3370 m.), Tunghohuanshan (3416 m.), and Ch'ilaichushan (3558·9 m.); cirque groups, Kartreppen, morainic mounds, terminal moraines, glacial valleys, arêtes, cirque lakes, and *roches moutonnées* near Hsüehshan (3884 m.) in the Hsüehshan range; the small cirque groups between Tapachienshan and Hsiaopachienshan, and the cirque groups north of Tapachienshan, on the eastern slope of Tahsüehshan, and in the Yüshan range. The mechanical weathering is rapid and severe in the mountainous regions of Taiwan, and formations from older glaciations have not survived to this date.

The Formosan salmon (*Oncorhynchus formosanus* Jordan et Oshima) in the Upper Tachia river and the high-latitude flora and insects of the island can be considered as glacial relics surviving from the Pleistocene.

LAND BRIDGE AND CHANGES OF THE SHORELINE

According to the topographic map of the Formosan Strait (Fig. 1) drawn by Niino and Emery (1961, fig. 4), the maximal depth of the sea water is 60-odd metres in most of the Strait, and the 100-m.-deep lines are seen only north of Keelung and in the Pescadores Channel. During the Günz, Mindel, Riss, and Würm 1 and Würm 2 maxima, if the sea level dropped more than 100 metres (according to European estimates), the shelf of the Formosa Strait must have been exposed, forming a land bridge between the island of Taiwan and the Chinese mainland, thus permitting movements back and forth of men and land animals and plants. During the interglacial maxima, on the other hand, the strait must have been covered with sea water of considerable depth, resulting in a temporary isolation of the island. Figures 2 through 9 are schematic representations of the land and water distributions on the Formosa Strait during the various periods of the Quaternary Period.

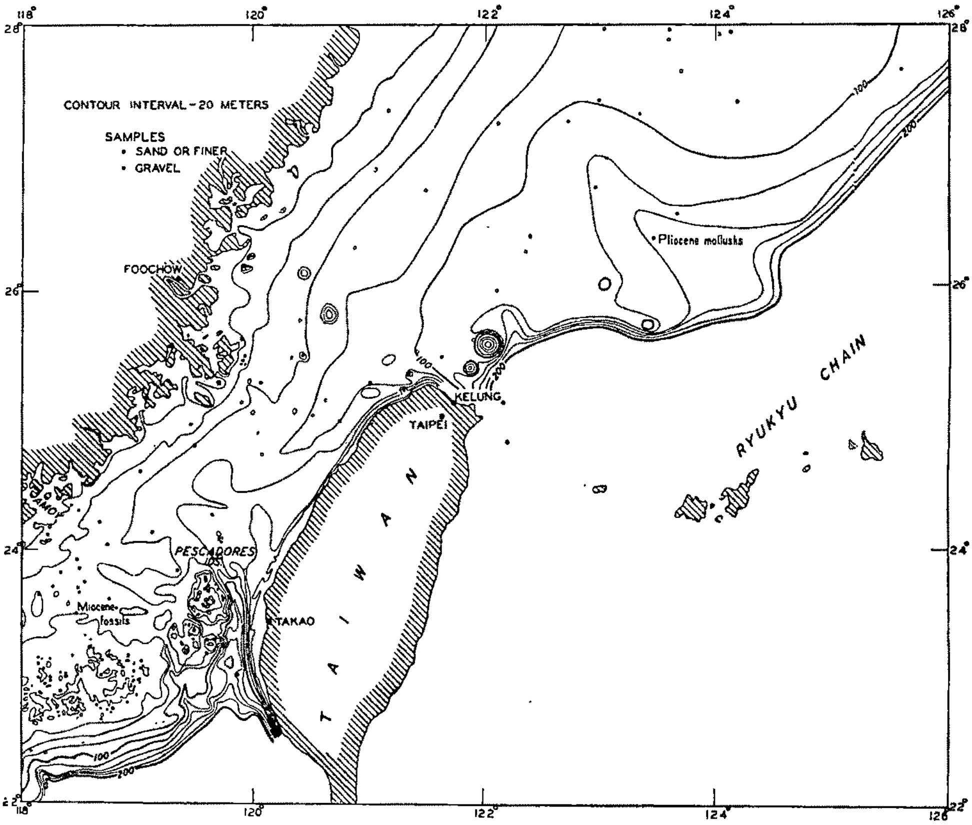

FIG. 1. Marine topography of Taiwan Strait and adjacent areas (after Niino and Emery 1961). Reproduced from *The Geological Society of America Bulletin*, **72**: 731–762, fig. 4 (with permission of the publishers).

These fluctuations of shorelines took place during the Holocene also. The recognized fluctuations in climate during the pre-Boreal, Boreal, Atlantic, sub-Boreal, and sub-Atlantic stages in Northern Europe and (known by different names) in North America were known to be associated with shoreline fluctuations, and the same phenomena appear in Formosa. In the T'ainan area, for example, at the maximum of the T'ainanian transgression the shoreline reached the foothills to the east of Hsinhua and near Kuanmiao, approximately the present 30- to 35-metre contour line. The neighbourhood of T'ainan was devoid of sea water, however, during the regressive period of the T'ainanian Age. In Early Holocene, at the maximum of transgression during the Tahu stage at the end of the Hualienian Age, sea water reached the present elevation of 7·5 to 10 metres, making an isolated islet of the T'ainan tableland. During the subsequent regressive interval, the various shell-mounds of the Tahu stage came into being along the then coasts and the drowned valleys. The Tahu shell-mounds can be further classified into a Niu-ch'outzu substage (Early) with cord-marked pottery; a Liuchiating substage (Middle) with combed black pottery; and an Antzu substage (Late) with plain red pottery. The topographical changes taking place in the T'ainan area during this regression are clearly indicated by the distribution of the shell-mounds of the three substages. After the formation of the Antzu shell-mounds, sea water began to be evacuated from the T'ainan area. A small transgression took place during the Akungtienian Subage of the Peipinian Age of the Upper Holocene, and sea water penetrated deep inland along the contemporary valleys. It probably reached the present elevation of 5 to 6 metres at the maximum of the transgression. The recent shell-mounds, in which the Anp'ing jars and other modern Chinese pottery have been found, were probably formed during the period of regression of the Akungtienian Subage or one of more recent date. According to early documents, a minor transgression took place in the T'ainan area in 1661 when the sea level was raised by about 3 metres, but this increase apparently lasted no more than a few years. Whether such records have geological significance cannot be determined.

The Taipei basin is a tectonic basin, formed during the Tientzuhuian Age when laterization of the land surface took place. Shortly after its formation the Taipei basin was submerged under sea water and became the ancient Taipei lake, which lasted from the Sungshan formation (that part of the T'ainanian Age when continuous deposits of sediments containing marine fossils occurred) through the end of the Milunian Age. After the Milunian the lake water drained away because of the collapse of the banks, and the whole region became a large swamp. A variety of lacustrine plants was abundant in the swamp which, in combination with plants washed into the basin as well as other native plants of the basin, subsequently forming the Taipei peats. In the peats have been found fossils of wild cattle and other mammals. Radiocarbon has dated the formation of the peats at about 4880 ± 300 years ago (Report no. WR-1016, Geochemistry and Petrology Branch, U.S. Geological Survey). Shortly afterward the basin surface tipped from the southeast toward the northwest, and the northwestern portions of the Taipei basin became a marshy and lacustrine region. Prehistoric men inhabited the neighbourhood of Yüanshan, on the eastern periphery of the lacustrine region, and their remains are known as the Kunghsia shell-mound. Another transgression took place,

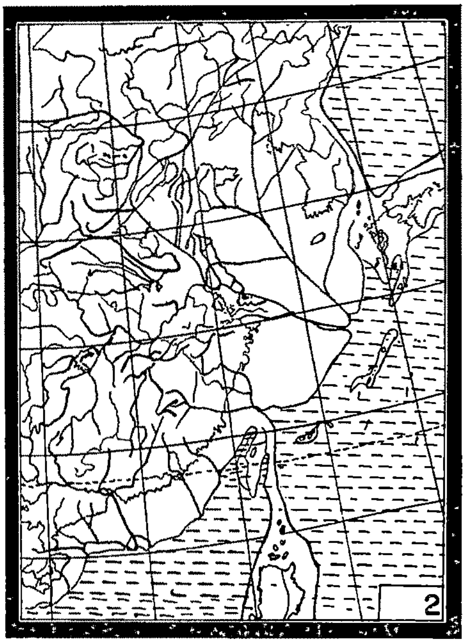

FIG. 2. Palæogeographic map of T'ouk'oshanian Age, T'unghsiao Subage (Pre-glacial)

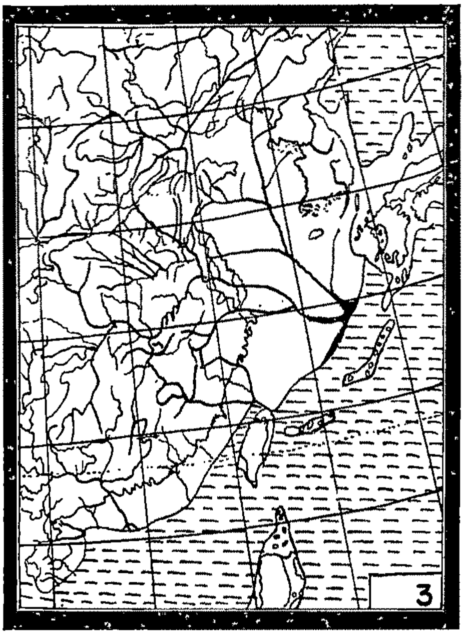

FIG. 3. Palæogeographic map of Tananwanian Age (Günz-Mindel Interglacial)

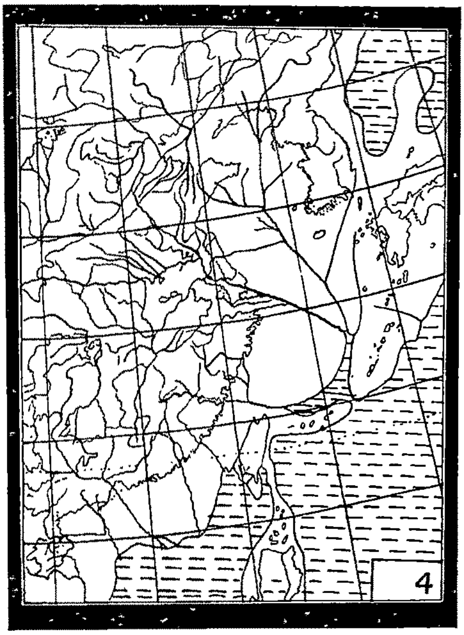

FIG. 4. Palæogeographic map of Tientzuhuan Age (Mindel Glacial)

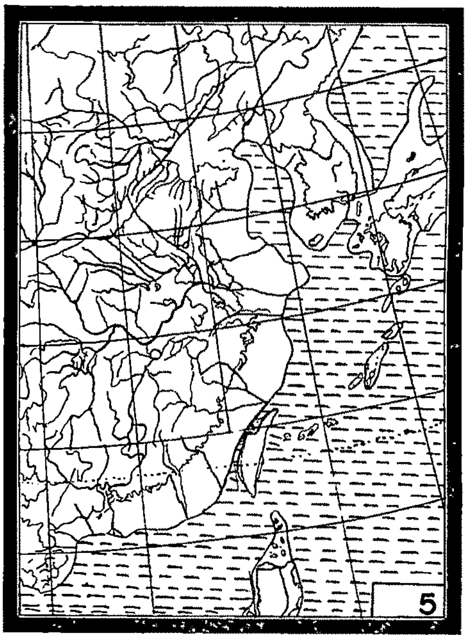

FIG. 5. Palæogeographic map of Tainanian Age (Mindel-Riss Interglacial?)

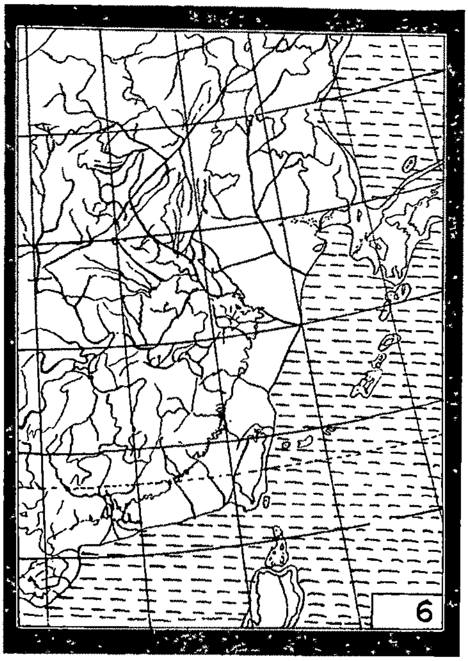

FIG. 6. Palæogeographic map between Tainanian and Milunian Ages (Riss Glacial?)

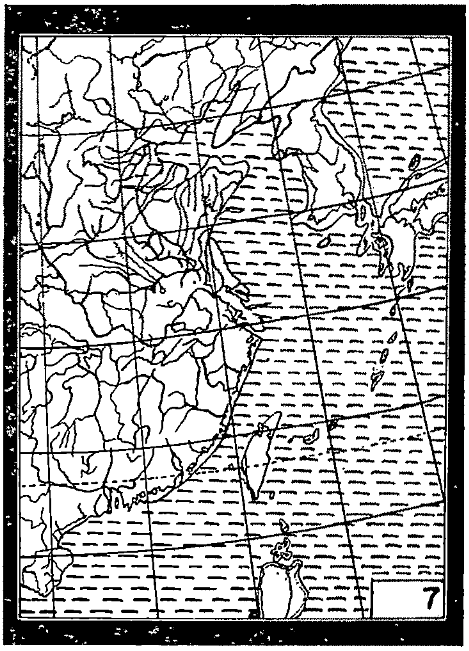

FIG. 7. Palæogeographic map of Early Milunian Age (Riss-Würm Interglacial?)

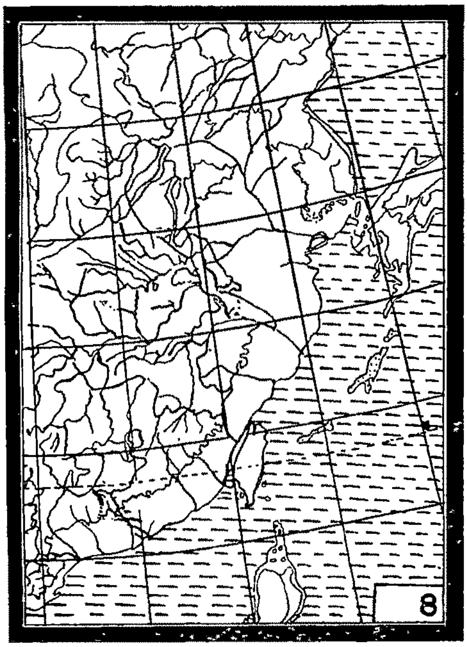

FIG. 8. Palæogeographic map of Middle or Upper Milunian Age (Würm Glacial, or Würm 2 stadium?)

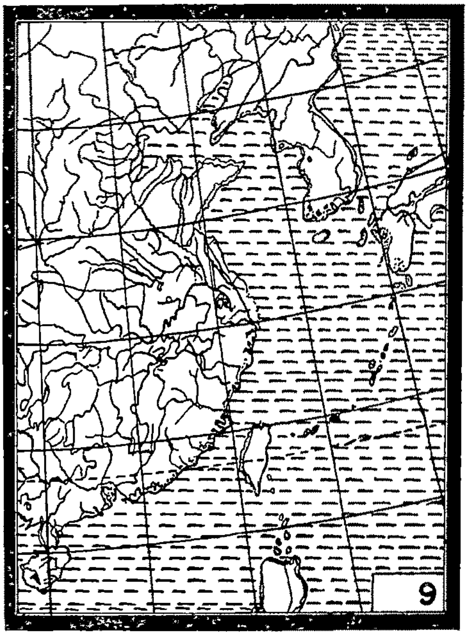

FIG. 9. Palæogeographic map of Hualienian Age (Post-glacial)

bringing the sea water again into the Taipei basin through the Kuantu pass. The Kunghsia shell-mound was submerged, and its inhabitants apparently moved onto higher land; the archæological site at Yüanshan shell-mound was apparently formed at this time. Another minor regression brought men down into the river valleys. A subsequent transgression, however, once more transformed the basin into a lacustrine region, larger in area than the previous Yüanshan shell-mound period. Fresh-water molluscs all but disappeared at this time, and salt-water and semi-fresh water species thrived. Another regression again extended the shoreline toward the sea, and such early sites as the Hsihsinchuangtzu shell-mound were formed in the low valleys along river banks. Early documents record that the last transgression took place in 1694 when an earthquake brought about the depression of a part of the basin and the entry of sea water. As far as can be judged, the surface of the basin at that time dropped not less than 3 metres. Since the 17th century the Taipei basin has been devoid of sea water.

In conclusion, the Quaternary Period in Taiwan was an age of rhythmic movements of transgressions and regressions of sea waters and fluctuations of shorelines. The scale of transgression decreased from one to the next, a fact which has made possible the preservation of many shell-mounds along the western coast of the island.

OROGENIC MOVEMENTS

Severe orogenic movements took place on Taiwan during the Quaternary Period in addition to fluctuations of sea levels. These have been grouped by the present author under the term, 'the Tungning orogenic cycle' (Lin 1957), which can be subdivided into the following phases:

Quaternary ages	*Orogenic phases*
Upper Holocene: Peipinian	Post-Hualien phase
	Hualien phase
Lower Holocene: Hualienian	
	T'aitung phase
Upper Pleistocene: Milunian	
	T'ainan phase
Upper Pleistocene: T'ainanian	
	T'aipei phase
Middle Pleistocene: Tientzuhuian	
Middle Pleistocene: Tananwanian	
Lower Pleistocene: T'ouk'oshanian	
Huoyenshanian Subage	P'englai phase
T'unghsiao Subage	
Tertiary—Pliocene	Pre-P'englai phase

The Pre-P'englai phase seems to have begun during the Neogene Subperiod. It is a period of small foldings, corresponding to the embryonic folding of the Tungning orogenic cycle. Because of this folding, a part of the Neogene subsystem emerged from the water and underwent erosional forces, providing sedimentary materials for the T'ouk'oshan group. For this reason gravels from the Neogene rocks are contained in the T'ouk'oshan group, the fossil Foraminiferas from which are thus also mixed with many secondarily derived fossils which were washed out of the Neogene Subsystem. Formed by this orogenic phase, the P'uli basin group is tectonic in origin, and in the basin have been deposited mud beds containing peats of the terrestrial T'unghsiaonian Subage and gravel beds of the Huoyenshanian Subage.

The P'englai phase witnessed the most violent orogenic actions in Taiwan's Quaternary history; these brought about the complex folds, simple folds, thrusts, overthrusts, and other formations in the western part of Taiwan, and completed the imbricated structure (Schuppen) of the Alishan range. The linear directions of the structures formed during this phase are completely parallel to the axis of Taiwan island. In the next phase, the T'aipei, blatts appeared which were nearly perpendicular to the linear direction of the P'englai phase structures, and block movements occurred on the island as a result of the formation of such transverse-fault groups, creating the Taipei basin among other structures. The T'ainan phase is characterized by north-south folds and high-angle faults. Formed during the T'ainan phase are the north-south-lying East Taiwan Great Fault scarp and the structural line of the T'aitung longitudinal valley; the Pianan tectonic line along the western edge of the Backbone ridge (including the Ch'aochou fault scarp); the Taichung tectonic basin; the Tatu-Pakua tilted block; the T'ainan tableland; and the Pescadores channel. The T'aitung phase is characterized by slow east-west folds and fault lines in the same directions. Formed during the T'aitung phase are the east-west fault in the middle part of eastern Taiwan and the slight fold in the T'ainanian and Milunian terraces along the eastern margins of the eastern coastal range. The forms of movement of the Hualien and the Post-Hualien phases largely reflect the geological structures of the Tertiary and the T'ouk'oshan group which was overlain by post-T'ouk'oshan deposits in the tablelands and coastal plains of West Taiwan.

Where the Tertiary and T'ouk'oshan group exhibit anticlinal structures, elongated terraces formed on the plain because of the orogenic movements during these last two phases; where the foundation rocks exhibit synclinal structures, depressions formed in the surface of the plain. During these phases, furthermore, ancient faults occasionally became reactivated. Some of the modern earthquake faults apparently reflect the formation of faults in the foundation rocks.

VOLCANIC ACTIVITIES

The Quaternary of Taiwan was a period of violent volcanic activity. The basalt and the basaltic pyroclastics of the Pescadores were active from the T'ouk'oshanian Age, through the Tananwanian and Tientzuhuian Ages, up to the T'ainanian Age. The andesite and the andesitic pyroclastics of the Tat'un volcanic group at the northern end of Taiwan began to be active from the T'unghsiaonian Subage of the T'ouk'oshanian Age; and evidence of their activities is seen throughout the Huoyenshanian Subage of the T'ouk'oshanian Age, the Tananwanian Age, the Tientzuhuian Age, and during the sedimentation of the Sungshan formation. The activity of dacite and dacitic pyroclastics of the Keelung volcanic group (including the Keelung islet) in the northeastern end of Taiwan began after the P'englai orogenic phase and lasted through the Tananwanian and Tientzuhuian Ages until after the T'aipei orogenic phase. The activity before the T'aipei phase was carried out by intrusion, and that after the T'aipei phase by eruption of the volcanic group.

The Quaternary volcanic activities on Taiwan also included those of basalt at Ts'aolingshan near Tahsi, and Chienshan near Hengch'un; and those of andesite and andesitic pyroclastics on the Agincort, Crag, Pinnacle, and Kuishan islets. They also included those of andesite and andesitic pyraclastics on all of Small Botel Tobago and a small part of Botel Tobago.

Pleistocene Man

During the several regressive periods of the Pleistocene, Taiwan was a part of the Chinese mainland and must have been near the Pacific coast. There were abundant forests and rich faunas and floras on the coastal plains and hills. Caves were available wherever limestones were present. It is probable that Taiwan in the Pleistocene was habitable, and, to my belief, it was then inhabited by men like those in the rest of South China.

The possibility that the animal assemblages driven by the cold climate during the Würm maxima into Taiwan from the north by way of the exposed shelf of the Formosa Strait has been mentioned by Kano (1954). During World War II Kano had the opportunity of examining several handaxe-like implements, found in gravel beds near Manila and Davao in the Philippines in association with stegoden bones, in the collection of H. O. Beyer of Manila, and made the remark that these implements closely resemble the palæoliths excavated by von Koenigswald in Java. On the basis of the conditions of preservation and making techniques, Kano concludes that these Philippine specimens can no doubt be called 'palæoliths'.

Studies in the geology of the ocean floors and ancient biological assemblages indicate that there must have been times during the Pleistocene when eastern Taiwan, Lutao, Botel Tobago, the Batan islands, the Babuyan islands, and Luzon were interconnected by land; or, at least, land bridges were available for their intercommunication. This route, in fact, must have been taken by the so-called Sino-Malayan fauna in their migrations from South China into Java by way of Taiwan, the Philippines, and Borneo. The discovery of the stegodon fauna on Taiwan further proves that Taiwan was in fact passed through by this fauna. No physical obstacle, therefore, stood in the way for Pleistocene Man to migrate from southern Chinese posts into the South Seas by way of Taiwan.

Y. Ino (1907) has reported two stone axes allegedly collected from a peat formation under Hut'ou hill at the northern end of the main island of the Pescadores. The peat formation in question is of Lower or Middle Pleistocene, and these two stone axes definitely belonged to Pleistocene Man if indeed they were found in the ancient peat. Unfortunately these specimens are now lost and cannot be examined, and their actual provenance cannot be determined.

Limestone caves exist among late Palæozoic marble rocks in eastern Taiwan, among the coral limestones of the T'ouk'oshanian Age on the Hengch'un peninsula, near Takangshan in Kaohsiung prefecture and Shoushan in Kaohsiung city, and among the T'ainanian coral limestones near Fengshan in Kaohsiung prefecture and Hsiaoliuch'iu in P'ingtung prefecture. Unspecified animal bones have been reported from the caves near Fengshan. Evidence of occupation of Pleistocene Man on Taiwan may well be brought to light from sediments in such caves.

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3

Excavations and Discoveries at Tap'enk'eng and other Prehistoric Sites of Pali District

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The Commission for Historic Research, Taipei Prefecture, undertook two seasons of excavations at the prehistoric site near Tap'enk'eng, in Pali district, the first lasting from 17 April to 2 May 1962, the second from 18 February to 11 March 1963. The author participated in the 1963 excavations, during which season reconnaissance and trial excavations were carried out at Tap'enk'eng and the nearby Shihsanhang shell-mound and the Hsiakutap'u site. This preliminary report of the 1962 and 1963 excavations and of the main discoveries is based on the author's field observations, field notes of both seasons, and a study of the excavated remains—the latter are still being examined; a detailed report about them and the excavations will appear later.

GEOGRAPHICAL AND HISTORICAL BACKGROUND

The Pali district of Taipei prefecture is on the left bank of the Tanshui near its mouth. Local traditions refer to it as Palip'en, the site of the Palip'en village of the Ketagalan aboriginals, who occupied the Taipei basin before the Han Chinese arrived. With higher water levels than the present and better shipping facilities, the Tanshui river made Pali an important Chinese post in the early colonial years. The Chinese arrived in this neighbourhood in the latter years of K'ang-hsi (1662–1722; Ch'ing dynasty), and made a settlement there in the first years of Yüng-cheng (1723–35). In the early part of Ch'ien-lung (1736–95), the settlement which grew into a town is referred to as Palip'en in *T'aiwan fu-chih.* The subsequent lowering of Tanshui water levels in this part gradually caused Palip'en to decline, and the town of Huwei (or Tanshui) across the river eventually became the leading port in northern Taiwan. Under T'ung-chih (1862–74), Palip'en sank into insignificance.

The archæological investigation of Pali district began under Japanese occupation. Artifacts in the Museum collections of the Department of Archæology and Anthropology, National Taiwan University, are recorded as collected, during Japanese occupation, in the district of Pali, but details of their provenance are lacking. A prehistoric site was found in the district at Miaohou, near the town of Tuch'uant'ou, by Kokubu Naoichi (1944: 30–44) toward the end of their occupation.

Intensive investigations of the district were carried out after World War II. In the winter of 1957 Professor Lin Chao-chi of the National Taiwan University discovered the Shihsanhang shell-mound near Tingkuts'un. In June 1958, when investigators from the Commission for Historic Research of Taipei prefecture came to revisit the Shihsanhang site, they located the Tap'enk'eng site on the slope of Kuanyin Hill, near P'it'outs'un, a short distance from the Shihsanhang shell-mound. Soon afterward, reconnaissance works undertaken under the Commission's auspices uncovered in that neighbourhood several new prehistoric sites such as Ch'angtaok'ou and Hsiakutap'u; and the Tuch'uant'ou site first identified by Kokubu was also revisited (Sheng 1960). Ta-p'en-k'eng is the largest site in area (350 × 250 m.) and yielded the greatest number of prehistoric finds; in fact, it is one of the biggest and most important sites found in the Taipei prefecture since the war.

The Tap'enk'eng site is on the northern slope at the foot of Kuanyin hill, near P'it'outs'un, in the district of Pali, on the southern bank of the Tanshui near its mouth. The valley to the west of the hill is called Tap'enk'eng, from which the site was named. The valley east of the hill is called Kamalank'eng, and the small village, Kungt'ien, is at the foot of the hill. The Provincial Bus Lines maintains a flag-stop at P'it'outs'un. Kungt'ien can be reached from the flag-stop along a small trail toward the southeast; from Kungt'ien a trail leads to Fengkuitouhu by way of Kuanyin hill; about half a kilometre from Kungt'ien, one turns uphill to reach the small temple of Tamukung, halfway to the top and about 50 metres above sea level. The prehistoric site at Tap'enk'eng centres around this temple.

Prehistoric remains are scattered on terrace-like slopes between Tap'enk'eng and Kamalan valleys, about 30 to 70 metres in elevation. There were more finds to the east of the Tamukung temple, but decrease in quantity to the west. The slope above 70 metres becomes steep, and a flat terrace is reached at about 140 metres, but no prehistoric remains have been found on it.

The site overlooks the Formosan Strait to the northwest and the Tanshui river to the northeast, both about 1·5 kilometres from the temple. The northeast slopes of the hill become steep, with a 17 to 20 degree gradient. A small creek circles the foothills between the site and Kamalan valley to the west, and flows into the Kamalan. The creek has abundant water all year round and is the main source of water for irrigating the fields near Kungt'ien and P'it'ou villages. The soil at the site is dark and loose, and has considerable depth. Small patches of land around the site are cultivated; sweet potatoes and peanuts are grown here, while groves of bamboo, pine trees, and *hsiang-ssu* trees (*Acacia confusa* Merr.) cover most of the hill. The hill and the surrounding valleys are covered with small and large pebbles and boulders, which have been used to mark off the cultivated fields; prehistoric stone implements are often collected near these rows of stones.

1962 EXCAVATIONS: TINGYÜAN

The first excavations on the Tap'enk'eng site were undertaken in April 1962. The bamboo grove east of the Tamukung temple is designated as Excavation Area A, and the pine grove west of the temple as Excavation Area B. Several trial pits, one metre square, were first dug at various spots to locate the centre of occupation and to reveal the underground stratigraphy of artifacts.

A shell midden area behind the temple in Excavation Area A, approximately 10 metres in diameter, was first selected for trial excavation, and eleven pits were dug. The first pit, designated as 18RO, contains a small amount of cultural remains to a depth of 30 to 40 cm., below which is sterile soil. Six more trial pits were then excavated a little downslope, designated as 9R0, 9R1, 9R2, 10R1, 10R2, and 11R1, and the following general stratigraphy was uncovered. The topmost layer is the surface soil, with a maximum depth of 15 cm.; below this is a layer from 10 to 15 cm. deep of grayish soil containing mollusc shells. Underneath this is a layer of dark, grayish loose soil, about 40 to 50 cm. deep. This layer gradually changes into a dark, brownish soil below, around 20 cm. thick. All these strata contain a large number of potsherds and, except for the surface soil and the topmost portions of the grayish, shell-containing layer, are undisturbed. Under the dark, brownish layer is yellow-brownish sterile soil containing boulders. Four more trial pits were opened nearby, designated as 8R0, 7R0, 7R1, and 6R0, and these revealed layers bearing cultural remains, 80 to 100 cm. in depth, although there were fewer mollusc shells here and none at all in some areas.

Another trial pit, 2 × 1 m., was dug in Excavation Area B, but only a very few artifacts were found.

From the twelve trial pits opened during the first season of work at the Tap'en-k'eng site, many cultural remains have been brought to light. All have been cleaned and processed, and are now being classified and catalogued. Among the stone implements are stepped adzes, flat chisels, polished hoes, chipped hoes, polished arrowheads, tubular beads (of soft, jadeish material), hammer-stones, stones with depressions, pillow-shaped artifacts with sockets, and grinding stones. In addition, there are iron objects (arrowheads and nails), coins, glass beads, glass rings, porcelain sherds of various ages, and many univalval and bivalval mollusc shells and animal bones. Potsherds constitute the majority of finds uncovered from the site. About half of these have plain surfaces; the other half are decorated. Those with plain surfaces or with pitted patterns were low-fired, reddish-brown or gray-brownish in colour, and with pastes and shapes similar to the ceramics of the upper stratum of the Yüanshan shell-mound. Sherds with net or checker patterns are much harder and reddish-brown, analogous to the so-called Ketagalan ware. Considering the great variety of stone implements and ceramics as well as the fact that ancient and modern porcelain sherds, coins, and iron artifacts were also found, the Commission believed that the Tap'enk'eng site was a stratified one, containing two or more different phases of culture. In the hope that more detailed excavation at the site might help to determine the cultural stratigraphy of the northern coasts of Taiwan as well as the absolute dates of the various strata cultures, the Commission decided on a second season of work at the site, and invited the Institute of Ethnology, Academia Sinica, to participate in the work.

1963 Excavations: Hsiayüan

The second season of excavation at Tap'enk'eng was carried out in 1963 with three aims.

i. To examine the stratified relationships of the various cultural phases at the site and the cultural contexts of mainland Chinese types, on the basis of detailed excavations, and to establish a cultural sequence in northern Taiwan and an absolute chronology;

ii. To excavate the natural and cultural remains of the shell middens in order to procure relevant data on the dating and cultural relationships of the shell-mound;

iii. To obtain a variety of cultural remains from the site to amplify our knowledge of its cultural contents.

Work began in Excavation Area C, a spot with scattered shell middens at the southern end of Tingyüan fields behind the Tamukung temple. Two trial pits, 1 m. square, were opened, but very few remains were found.

Attention was then focused on Excavation Area D, the spot locally known as Hsiayüan (downslope from Tingyüan), where sweet potato was planted; there prehistoric remains were found scattered on the surface. Three trial pits were dug, 1 m. square, designated respectively D–1, D–3, and D–7. Abundant remains were brought to light in this area, and D–3 was increased to 2 m. to a side. Remains from D–3 were recorded according to four quarters, D–3, D–3a, D–4, and D–4a, and artificial layers of 10 cm. each were made and designated as layer 1, layer 2, and so on, from the top down. After the artifacts were removed from the ground, the earth was sifted with a large round bamboo sieve, about 40 cm. in diameter with 1-cm. square holes.

The cultural stratum in Excavation Area D has a depth of 90 to 100 cm. and contains two different cultural phases. The upper phase is 80 to 90 cm. in thickness, containing gray-brownish or reddish-brown ceramics of coarse paste with plain surface, and characterized by ringfeet, handles, and clustered incisions on the handles. The most common stone implements are stepped adzes and arrowheads. This phase of the Tap'enk'eng culture is apparently related to similar cultural assemblages from the upper stratum of the Yüanshan shell-mound, the upper stratum of Chihshanyen, and the lower stratum of Chiangt'ou, as well as Chienshan, Ch'ilian, Yüanshantzu, T'utikungshan, Kuweishan, Chanlungshan, and Panshantzu, in various locations in the Taipei basin.

The lower phase has a depth of approximately 10 cm. and is predominantly characterized by cord-marked potsherds. These are reddish-brown or dark brown, hand made of coarse paste, sand-tempered, and with thick and heavy walls; a few are plain, but most sherds are impressed with cord marks, and a very few exhibit basket patterns. Similar corded-ware phases have been found heretofore from the lower stratum of Yüanshan, the lower stratum of Chihshanyen, as well as Ch'ingyünyen, Yüanshantzu, Hsiakutap'u, and other sites.

Besides its stratification of cultural phases, the Tap'enk'eng site is important because of the discovery of a bronze arrowhead (Fig. 1), the first bronze weapon from the prehistoric period to be found on the island of Taiwan. It was sifted from the earth from the layer 5 (40 to 50

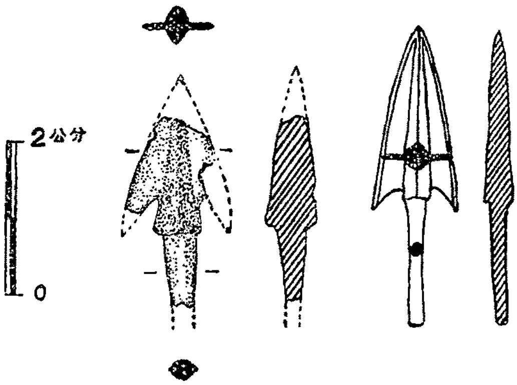

FIG. 1. Bronze arrowheads excavated from Tap'enk'eng *(left)* and Hsiaot'un *(right)*.

cm. deep) in D–3a. My field notes describe this arrowhead as follows: 'It was cast with double moulds from both sides; highly oxidized and covered completely with verdigris; two blades, long shaft with a solid stem; the point is broken and missing; one of the rear points of the blades is completely, and the other partially, broken and missing; the blades have bilaterally bevelled edges; the shaft extends lengthwise posteriorly beyond the blades and is thickest at the point where it joins the stem; the stem is cylindrical and is broken at the end; 25+ mm. long, 10+ mm. wide; the shaft is 6·5 mm. wide and 8 mm. thick; the stem is 9·5 mm. long; the weight of the arrowhead is 1·6+ gm.'

1963 EXCAVATIONS: TINGYÜAN

After the excavation of Area D was completed, Area A at Tingyüan was re-excavated, and again a square pit was opened, 2 m. to a side, subdivided into four quarters (3R3, 3R4, 4R3, and 4R4). Square 4R3 was the first to be dug, and artificial 10-cm. layers were distinguished. The cultural stratigraphy encountered in this pit follows.

The surface soil is about 20 cm. deep, mixed with fragmentary mollusc shells, and yielded modern Chinese coins and reddish-brown potsherds of considerable hardness and with net-like designs. Below this were undisturbed deposits of prehistoric remains, predominantly potsherds. The third and fourth layers (20 to 40 cm.) yielded reddish-brown sherds of great hardness with net patterns, but reddish-brown potsherds of great thickness and with checker impressions began to appear toward the lowest levels of the fourth layer. Thick potsherds with checker impressions were found predominantly in the fifth and the sixth layers (40–60 cm.). Gray-brownish sherds with plain surfaces began to occur toward the bottom of the sixth layer, and from the seventh layer on the gray-brownish or reddish-brown potsherds predominated. The last layer of deposits achieved a depth of 40 cm. (60 to 100 cm.).

The importance of 4R3, which contained no fewer than four cultural phases in stratified relationship, was immediately recognized, and for greater accuracy 5-cm. layers were distinguished in the excavation of the remaining three quarters of the trial pit. The cultural stratigraphy of these three squares is identical with 4R3. After the sixth layer (50 to 60 cm.), as was the case with 4R3, the soil changed from dark, loose earth to a sticky yellow-brownish earth, and excavating became difficult. Big boulders were met at 1·30 m., which marks the maximal depth of the excavation.

The cultural phases brought to light at Excavation Area A at Tingyüan are as follows. The lowest phase is characterized by gray-brownish and reddish-brown potsherds and can be synchronized to the upper phase at Hsiayüan, described above. Both of these phases are apparently related to the Yüanshan culture. Above this at Tingyüan is a phase characterized by thick, reddish-brown potsherds with checker impressions, similar to the ceramic phase identified at the Botanical Garden of Taipei city, Shuiyüanti, and Koutishan, T'anti, Yingp'ank'ou, Panshantzu, and Tayüan near the town of Shulin. Lying above this phase is another characterized by reddish-brown, hard potsherds with net patterns, similar to those found in the upper layer of Chiangt'ou A, Chiangt'ou B, the Shêtzu shell-mound, the Hsihsinchuangtzu shell-mound, Shuiyüanti of Taipei city, Liuchangli, and the Shihsanhang shell-mound which is on the coast more than a kilometre northwest of this site.

The uppermost phase of the Tingyüan site is characterized by modern potsherds and porcelain sherds of Chinese origin and is apparently of modern Chinese culture.

Excavation Area A at Tingyüan and Area D at Hsiayüan, at Tap'enk'eng, combine to make the following archæological sequence by phases:

Fifth, modern Chinese phase (Tingyüan IV).

Fourth, hard pottery with net patterns (Tingyüan III).

Third, thick pottery with checker patterns (Tingyüan II).

Second, reddish-brown pottery with plain surfaces (Tingyüan I and Hsiayüan II).

First, corded-ware phase (Hsiayüan I).

SHIHSANHANG

After excavating at Tingyüan and Hsiayüan at Tap'enk'eng, it was decided to investigate again, for comparative purposes, the nearby Shihsanhang and Hsiakutap'u sites, where net-patterned hard pottery and corded ware were reported from previous reconnaissance.

Shihsanhang is near the Tingku village in the Pali district, at the triangular area between Tanshui river (about 1 km. to the northeast) and the sea (about 200 m. northwest). The prehistoric site is on an elevated surface, about 350 m. long and 200 m. wide, which is about 1 m. above the nearby ground and 2 to 3 m. above sea level. Some twenty households occupy this elevated surface and use the several ponds of various sizes to irrigate their fields lying some distance away on the level ground. A small creek used to flow along the west side of the site from sources in the Tap'enk'eng valley, but has dried up and is now part of the farm area.

Trial diggings were conducted in the sweet potato gardens west of the house of Mr Chen Shuitu, in the village of Tingkuts'un, at a spot west of pit A2 (designation by the Department of Archæology and Anthropology, National Taiwan University, which did a trial excavation here in March 1959). A square pit, 2 by 2 m., was opened, and the same procedure as that used at the Tap'enk'eng site was followed. The earth in the pit was rather sandy. The surface soil contained some fragments of mollusc shells but had no well-formed shell midden layers. A large number of complete or restorable porcelain pots was found from a depth of 30 cm. and below, in undisturbed deposits, side by side with hard potsherds with impressed patterns. Below this layer is a stratum characterized by hard potsherds with impressed patterns, which reaches a depth of over 80 cm. before sterile sandy layers are met. Another pit, 2 by 1 m., to the east of pit A7 of the Department of Archæology and Anthropology, was excavated in the vegetable garden at the back of the Chen house. Compactly packed mollusc shells were found in this pit from 20 to 70 cm. below ground level; mollusc shells diminished in amount below the 70-cm. mark and disappeared after 90 cm. In the shell middens are many animal bones and reddish-brown potsherds of great hardness with net patterns.

These two pits indicate that no fewer than two cultural phases can be established at the Shihsanhang site: an upper phase of modern Chinese culture and a lower phase of hard, reddish-brown pottery with net patterns; the shell middens were associated with the lower phase.

Hsiakutap'u

The investigation of the Hsiakutap'u site took place on the last day of the second season of excavations. The site is located on the slopes of the northeastern end of the Link'ou terrace, about 1·5 km. southwest of the town of Pali, about 500 m. south of the seashore, and a few score metres below the First Public Cemetery of Pali district. Prehistoric remains were scattered in an area approximately 50 by 50 m., and clustered in two spots, in sweet potato and peanut fields. A trial pit about 1 m. long and 50 cm. wide was opened at the centre of the cluster of surface remains situated downslope. Reddish soil of hard consistency was reached in the pit after about 20 cm., and from 5 to 15 cm. deep in this reddish soil were scattered reddish-brown or dark brown potsherds of coarse paste, sand tempered and of great thickness, most of them impressed with cord marks. Many potsherds have been collected at this site since its discovery in March 1959 by the Commission; they are all identical with those obtained at this time from the trial pit. It appears likely that this is a single-phase site characterized by corded pottery.

Summary and Conclusions

The two seasons of excavation at Tap'enk'eng and vicinity have produced several important discoveries. Two of them are of far-reaching significance: the stratification of no fewer than five phases of prehistoric and historic cultures, and the finding of the bronze arrowhead, coins, and other artifacts of mainland Chinese affinities.

It has been known that the prehistoric cultures in northern Taiwan can be grouped into the following phases: the corded-ware phase; the phase of red-brown, coarse pottery (or the Yüanshan culture, also known as the culture of Stepped Adzes); the phase of checker-impressed pottery; and the phase of hard pottery with net patterns. The sequential order in which these different ceramic phases were introduced into northern Taiwan has long been in dispute among specialists (Kano 1952; Chang 1954), but in the absence of stratified sites no agreement can yet be reached. The new findings at the sites at Tap'enk'eng not only contribute a stratigraphical sequence of five different cultural phases to the prehistory of northern Taiwan, but also provide artifacts of mainland Chinese affinities that help to date some of these cultural phases in absolute years.

The excavations of the prehistoric site at Tap'enk'eng show that it was occupied continuously from the earliest corded-ware phase through the introduction of modern Chinese civilization, apparently because of the ecological advantages of the area and its strategic location in prehistoric and historic lines of communications.

The bronze arrowhead excavated from the Yüanshan Culture stratum in the upper layer of the Hsiayüan site at Tap'enk'eng (DII) is typologically analogous to the Shang dynasty arrowhead of the two-winged, long-shafted, and stemmed type known from the site of Hsiaot'un (Fig. 1) (Li Chi 1952). The only other possible Bronze Age source of the Tap'enk'eng arrowhead in Eastern Asia would be the area of the Dongson Culture in Southwest China and Indochina, but the typology of Dongson arrowheads appears to differ from our specimen. Most of the bronze arrowheads unearthed at Shihchaishan near Chinning in Yünnan (Yünnan Museum

1959) are of the socketed variety; a few are stemmed, but their shafts are prismatic instead of flat. The site at Dongson in North Vietnam as described by Olav Janse (1958), has yielded bronze arrowheads with spearhead-like elongate shafts with hollow sockets at the end; Janse thinks that this type as well as other three-winged varieties discovered in Dongsonian sites in Indochina are characteristic of the Dongson civilization, and are obviously different from the Yin types at Hsiao-t'un. Thus there is little doubt that the Tap'enk'eng arrowhead is of the Hsiaot'un type and that its historic connections must be sought for in that direction. Bronze arrowheads of the Hsiaot'un type have been found elsewhere in South China—at Lamma island of Hong Kong—and Father Finn (1958) is of the opinion that this type of bronze weapon was introduced into Hong Kong during the Western Han dynasty at the latest. This estimated date of its introduction is definitely conservative, and a much earlier date is not to be ruled out.

The communication between North China and the South Seas began at least as far back as the Shang dynasty. Some of the turtle shells found at Hsiaot'un, used for divination purposes, were certainly from a southern species found today along the coasts of Fukien, Taiwan, Kwangtung, Hainan island, and even Malaya. In discussing the relationship of South China and the Yin dynasty cultures, Jao Tsung-yi (1954) concludes:

> The ancient cultures of Kwangtung apparently contained some Yin-Shang culture elements in their aboriginal Yüeh base. It appears that the southeastern coastal regions had communications with North China as early as the Yin dynasty. Since big turtles were included among the tributes to the Yin from Malaya, it is entirely possible that Northern Chinese cultures diffused southward during that early date. The close relationship between the Yin civilization and the prehistoric cultures of South China is attested by the discovery of the 'Hsiao-t'un stone knife' and white pottery in Kwangtung, by the shapes of the beaten pottery vessels that recall Yin dynasty *cheng* vessels, by the similarities of some of the beaten pottery patterns to the decorative designs on the bronzes and white pottery of the Shang Dynasty, and by the so-called double-F pattern which appears to be a local expression of Hsiao-t'un art.

Unless on the basis of evidence not now available it can be shown that the people of the upper phase of Hsiayüan brought a bronze culture with them when they immigrated into northern Taiwan, the best assumption is that the Hsiayüan II bronze arrowhead was imported from South China, possibly by way of Hong Kong. The three-winged bronze arrowhead replaced the Hsiaot'un two-winged type in North China from the period of the Warring States (*c.* 450–221 B.C.) If the two-winged bronze arrowhead of Hsiayüan was imported directly from North China, it cannot have been at a later date than the Warring States period. If, on the other hand, it came by way of South China, its date still cannot be later than the Han dynasty. With this evidence we may now date the upper stratum of the Hsiayüan site (i.e. the Yüanshan culture) to the interval between the Shang dynasty and the end of the Han, or about from 1600 B.C. to A.D. 200. Accordingly, the Corded Ware Horizon probably lasted until the beginning years of the Shang dynasty, if not earlier, before it gave way to the succeeding Yüanshan culture.

In addition to the Yüanshan culture, the cultural phase of hard pottery with net patterns excavated from the third layer of the Tingyüan site can also be dated according to the mainland Chinese artifacts found in undisturbed association with the native pottery. Edged stone implements were not present in this stratum; iron implements found here indicate an eneolithic status of this cultural phase. A coin was also found from this stratum, with a circular outline (3 cm. in diameter) and a square hole (6 mm. to side); it bears an incomplete inscription with two characters, *t'ung* (circulation) and *li* (part of the reign name of the Ming dynasty, either Wan-li, 1573–1619, or Yüng-li, 1647–62). This coin appears to date the Ketagalan culture in northern Taiwan to the middle or later part of Ming. This dating has the added support of a Hung-wu coin (1363–98) discovered at the Aoti site, also a Ketagalan settlement on the northern coast (Kanaseki and Kokubu 1953). The third layer of the Tingyüan site has also yielded porcelain sherds which, pending expert examination, seems to be of a type no later than Ming. It is known that Chinese immigrated into this district toward the end of Ming and the beginning of Ch'ing, and established a town here in the first years of Ch'ien-lung, whose reign began in 1740. In conclusion, the duration of the Ketagalan cultural phase, with hard pottery with net patterns, can be placed within the Sung and Ming dynasties (*c.* 900–1700).

It follows that the cultural phase with checker-impressed pottery which has been shown to be sandwiched stratigraphically between the Yüanshan and the Ketagalan cultures, must have come into the northern part of Taiwan around the time of the Six Dynasties (*c.* 200) and probably lasted until the T'ang dynasty (*c.* 900).

The cultural sequence and chronology of the coastal sites in the district of Pali is illustrated by the accompanying table (Table 1).

TABLE 1. CULTURAL CHRONOLOGY OF PALI DISTRICT SITES

Dates	*Cultural Phases*	*Tap'enk'eng*		*Shihsan-hang*	*Hsiaku-tap'u*
		Tingyüan	*Hsiayüan*		
	Modern Chinese	IV		II	
1500					
	hard pottery with net patterns (Ketagalan)	III		I	
1000					
A.D. 500	pottery with checker impressions	II			
0					
B.C. 500	Yüanshan Culture	I	II		
1000					
1500	Corded Ware		I		I

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4

The Prehistoric Southern Islands and East China Sea Areas*

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I

The Ryūkyū islands, in the East China Sea, are connected with Kyūshū island in the north by way of the Amami-Ōshima and the Satsuman islands, and with the Philippines in the south by way of Taiwan. Among these Ryūkyū islands, the Yaeyama group are on the whole closer to Taiwan than to Japan, and particularly Yonaguni and Hateruma which are nearest to Taiwan to the west—actually Taiwan can be seen from both islands when the sky is clear. That almost no oral traditions, either on the Taiwan side or on the side of the Ryūkyūs, speak of past contacts between them, is rather curious—perhaps because no cultural communications took place during the recent periods. Nevertheless in Yaeyama in the Ryūkyūs, an oral record seems to reflect a rather vague knowledge of a large island to the south, which in all probability is the island of Taiwan.

According to Dr Tōsō Miyara (1934), people on Yaeyama once referred to Taiwan as *pitokuhai jima*, 'the island of the cannibals'. On Yonaguni, Taiwan was called the island of Ogres and was very much dreaded; it is said that the people there made giant straw sandals and set them adrift on the sea when the northern wind blew. This custom of intimidation would suggest that giants lived to the south (Inō 1918). This legend is said to derive from a custom on this island of collecting worms in the fields and setting them adrift in sandals on the day of *doumonomunun* (Mabuchi 1952). In any case, these oral traditions seem to indicate some uneasiness toward a big island lying to the south and may be due to news of head-hunting activities of the Formosan aborigines reaching the Yaeyama natives.

In mid-17th century we know that a Torobuan tribe panned gold near the mouth of the Takkili river in the northern part of Taiwan, and that among the gold panners were some Japanese; it is possible that some Ryūkyū natives also participated. According to Professor Takashi Nakamura, a Spanish traveller of the late 16th century relates that the inhabitants of the 'Lequeo' Islands traded deerskins and small golden nuggets with the Chinese territories (Nakamura 1949). Since 'Lequeo' is apparently another pronunication of Ryūkyū, the Ryūkyūans, by the mid-17th century, probably had found their way to the territory of the Torobuan tribe. Professor Mabuchi (1952), however, says that immediately after the Atayal invasion of the eastern coast, the Torobuans left their native place; their gold-panning activities came to a halt; the original location of the Torobuan tribe thus became forever obscure, although fragmentary tales about it vaguely survived in the oral traditions of the present coastal peoples. Communications between the Ryūkyūans and the Formosan natives were probably severed at just about then. If among the coastal natives of Taiwan the location of such recent predecessors as the Torobuan is known nowadays only vaguely, it is not really strange that past communications between the Ryūkyūs and Taiwan has become faint and uncertain memories within three centuries. However, in the long prehistoric period we find evidence of past communications between these two regions, and also, evidence that southern Chinese influences reached the Ryūkyūs and the regions to their north; but whether they passed through Taiwan cannot be said for certain. We do discern certain cultural elements which appear to have come to the Ryūkyūs from the south by sea immediately east of Taiwan. Conversely, there are also influences spreading southward from the Kyūshū area. What follows is a study of the pattern of cultural distributions and stratifications in this area derived from our present evidence of such cultural contacts and movements.

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* The name 'Southern Islands' in the title and throughout the text is a literary translation of the Japanese word *nanto* 南島, which in Japanese usage is a synonym of the Ryūkyū islands in the geographic sense. [*Editorial Note*]

II

From their prehistoric pottery, the islands between Kyūshū of Japan and Taiwan, ranging from Satsuman islands to Ryūkyūs, can be grouped into three culture areas—the northern, the central, and the southern (Fig. 1).

The northern culture area centres around Tanegashima and Yakujima. Covering the Early Jōmon stage through the Yayoi period, this culture area belongs largely to the prehistoric cultural sphere of Kyūshū.

The central culture area comprises the Amami-Ōshima islands and the main Ryūkyū islands. The pottery influence in southern Kyūshū reached the Amami-Ōshima area. Pottery of the Ichiki style (Late Jōmon), which prevailed from southern Kyūshū to Tanegashima, Yakujima, and Kuchinoerabu-jima, and pottery of the Issō style which occurred side by side with the pottery of the Ichiki style on Tanegashima, Yakujima, and Kuchinoerabu-jima, have been found in the lower stratum of the Ushuku shell-mound on the main island of Amami-Ōshima, together with pottery of the early period of the central culture area. Moreover, in shell-mound no. 4 at Omonawa on Tokunoshima, the lower-stratum pottery of the early prehistoric style was found in association with pottery forms similar to the Ichiki style. According to Mr Teitoku Kawaguchi, pottery of Yayoi style reached the far off Okinoerabu-jima. This influence of the northern area was felt by the central area of the Southern Islands from approximately Late Jōmon to the Yayoi-style pottery periods.

The decorative patterns of pottery of the early period in the central culture area suggest derivation from bamboo basketry motifs. It is therefore probable that in the central culture area of the Southern Islands bamboo basketry preceded pottery. This pattern underwent a gradual process of simplification to disappear in the late stage. The pottery bases were gradually reduced in size and eventually evolved into pointed bottoms. On the main island of Okinawa, prehistoric sites gradually descended from high terraces and other high grounds to the lowlands, and in the late stage were on the sea coasts. Net sinkers with mollusc shells were especially fashionable, and would suggest that net fishing was important in the late stage.

The southern culture area includes Miyako and the Yaeyama islands. The pottery of this area is totally different from that of the central. The pots excavated from Shimotabaru on Haterumajima seems to be the only archaic types found so far in Yaeyama. Although everted rims are occasionally met, most of the pots have nearly straight mouth rims and flat bottoms. Types with handles placed near the

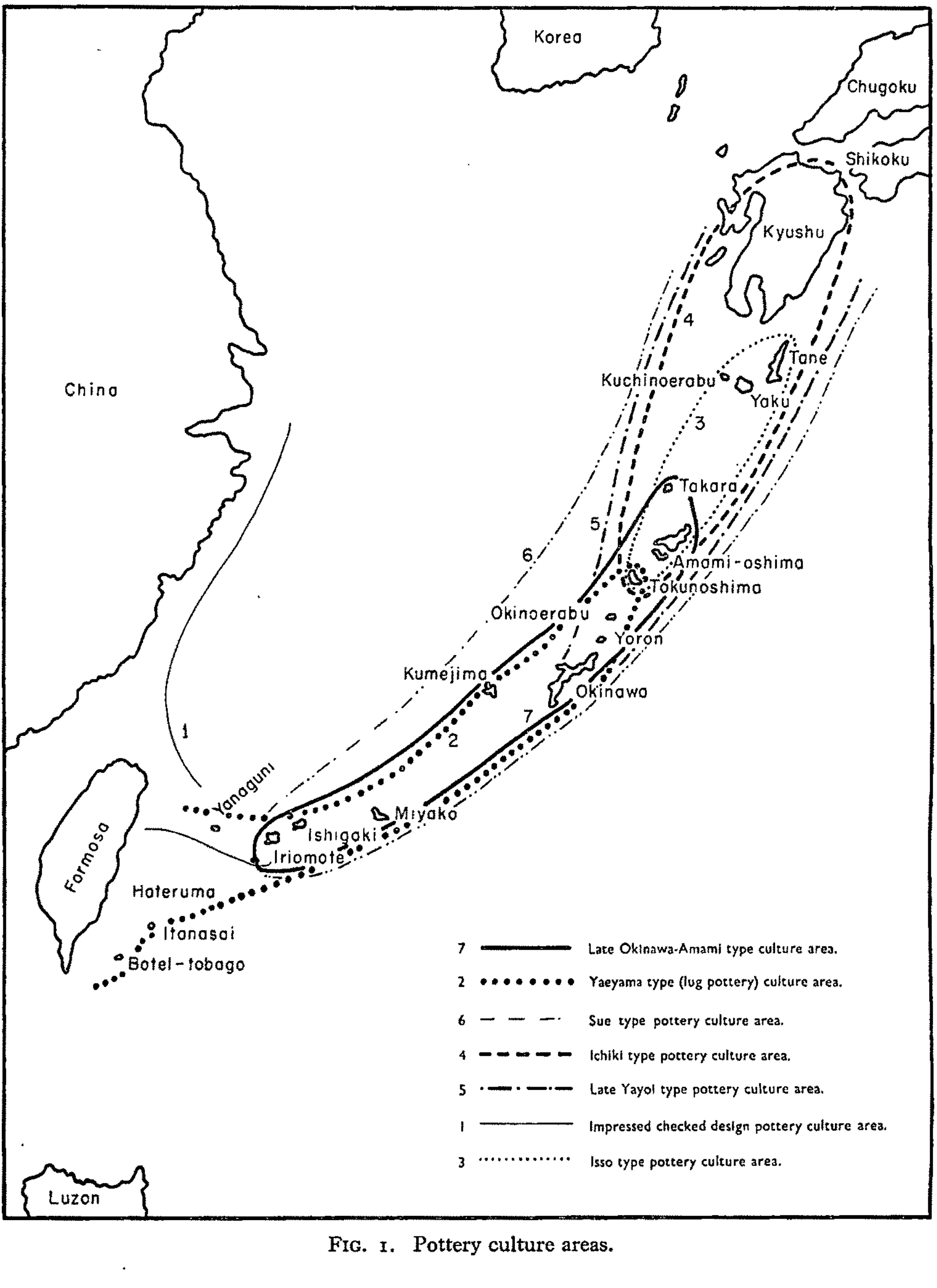
Korea
Chugoku
Shikoku
Kyushu
China
4
Tane
Kuchinoerabu
Yaku
3
Takara
5
6
Amami-oshima
Tokunoshima
Okinoerabu
Yoron
Kumejima
Okinawa
7
2
1
Yonaguni
Miyako
Ishigaki
Iriomote
Formosa
Hateruma
Itonasai
Botel-tobago
Luzon
7 Late Okinawa-Amami type culture area.
2 Yaeyama type (lug pottery) culture area.
6 Sue type pottery culture area.
4 Ichiki type pottery culture area.
5 Late Yayoi type pottery culture area.
1 Impressed checked design pottery culture area.
3 Isso type pottery culture area.

FIG. 1. Pottery culture areas.

rims were also present. Compared with the Shimotabaru type, the rims of the pottery of later stages are characteristically everted instead of straight, and types with handles are also common. At Shimotabaru, stone axes with ground or half-ground edges prevailed and were presumably farming implements. The iron hoe in use today for dry-land cultivation, called *bira*, seems to have preserved the tradition of the semi-ground stone-axe forms. This kind of stone implement appeared at Nakama shell-mound no. 1 on Iriomote before the appearance of pottery. It seems that some sort of farming culture existed in Yaeyama at an early date. Although the appearance of pottery is related to cooking in general, it is especially necessary in cooking cereals. In Yaeyama, millet may be called the most important cultivated plant. The pots used for boiling millet during the performance of millet-harvest festivals in the houses of priests on Hateruma resemble the prehistoric pottery of the Shimotabaru type. From this pottery evidence the cultivated plant in Yaeyama we may infer was on other than millet.

It is not clear why stone implements of the *bira* type are not conspicuous north of the central culture area in the Southern Islands, where wooden digging sticks seem to predominate. A wooden digging stick, once used on the island of Kumejima, is preserved in the museum of Shuri in Okinawa. During the New Year festivities at Cape Satsuma on Kyūshū, we know of boys, in groups, playing at digging the fields with digging sticks. This would indicate a tradition of digging sticks in this region.

Taro and yams seem to have been cultivated in addition to millet. On Okinawa wooden farming implements of the *bira* type were probably used, and may have been used to cultivate wet taro preceding wet rice. Among the crops of Yaeyama a kind of yam is referred to as *bung* or *bong*. That this tuber should be used exclusively for festivities and in treating honoured guests suggests that it is a very early plant. Professor Mabuchi told me that yam was called *bung* by the Ami group on the eastern coast of Taiwan. Ami's *bung* and Yaeyama's *bung* and *bong* are obviously connected.

III

We now come to the data of cultural contacts between the prehistoric Ryūkyūs and the various regions in the East China Sea area according to archæological materials.

1. *Preceramic Period and the First Appearance of Pottery*

That human beings occupied the Ryūkyūs before the appearance of pottery is evident. On Iejima in the Okinawa group, artificially worked deer bones have been excavated (Tokunaga and Takai 1938). The large amount of clearly broken fossil deer bones in the fissures of coral reefs is indicative in some manner of prehistoric inhabitants. Beyond question the deer bones excavated from a cave at Uhji, near Chinen village on Okinawa, were broken by man. Their slight degree of fossilization however does not strongly suggest that they are of the Pleistocene period. Dr Teruhiko Senba of Kyūshū University told me that these bones are not of great geological antiquity, in his opinion. According to him the Uhji deer belonged to the Yaku deer group; and thus it is probable that the preceramic inhabitants appeared here during the period when deer existed on the larger islands in the Southern Islands. Although we do not know what kinds of stone implements were manufactured during the preceramic period of Okinawa, we do know that stone implements of the *bira* type with ground edges appeared on Yaeyama during the preceramic period. Type sites of this latter sort include the Nakama shell-mound no. 1 on Iriomote. In the Southern Islands before the appearance of pottery, the two possible ways of cooking food were: to use shell utensils or, like the modern Polynesians, to wrap food in leaves and steam it with heated stones. Evidence of the latter method has been found in Nakama shell-mound no. 1.

The origin of pottery in the area still remains a question. Did pottery appear here as an independent invention, or was it the result of outside influence? Relevant to this question is the fact that the pottery of the central culture area (Okinawa-Amami-Ōshima) and of the southern culture area (Miyako-Yaeyama) exhibit totally different features. It is indeed very curious that the inhabitants of these different areas with the same physical constitutions and the same fishing-shifting-farming mode of life should possess pottery of such divergent types. This immediately suggests that the central and the southern areas possibly received cultural influences from different directions. Centres of powerful cultures are in fact found both to the north and to the south of the Southern Islands. The central area is subject to the influence of the southern Kyūshū culture area by way of the northern culture area including Tanegashima and Yakujima. The southern area, on the other hand, is subject to the influence of the more southerly regions such as Taiwan and Luzon; and it is also easily accessible from areas in South China. The pottery of the central area, when compared with that of the southern area, is evidently of different origin.

From the pottery of the early stage of the central culture area, one cannot deny its affiliations with the Middle and Late Jōmon pottery of Kyūshū. The bamboo basketry peculiar to the region may have strongly influenced its ceramic styles. The pottery of the southern culture area, on the other hand, must have been related to the appearance of farming cultures of southern origin, and particularly of millet cultivation with the plain, thick pottery suitable to the cooking of millet and other cereal grains. Pottery with horizontal, ear-shaped handles near the mouth rims has been seen in the prehistoric period on the eastern coast of Taiwan (Plate III). Identical lugs are also attached to some of the millet-cooking pots at Botel Tobago. Pottery with a thick wall and roundish or flattened bottoms has been found on the Hsiaoliuch'iu islet near the southern part of the western coast of Taiwan.

Although the present evidence is not yet sufficient to postulate definite historic connections between the Yaeyama area and southern Taiwan, such relationships merit further research. The method of considering the distribution of millet cultivation according to shell knives will be discussed later.

2. *Ridged Stone Axe and Axe of the* Bira *Type.* (Plate I)

The chipped stone axes in prehistoric Taiwan are generally considered cultivating implements. Among the Bunun tribe in the mountainous regions, polished stone axes were called *tombo-madadaigas*, or 'ancestors' axes', and chipped stone axes were called *taga-madadaigas*, 'ancestors' hoes', or *tonga-bat*, 'stone hoes'. These oral traditions do suggest that the prehistoric chipped axes in Taiwan were possibly used as hoes.

In prehistoric Taiwan, chipped stone axes with a long ridge along the back are seen along both western and eastern coasts. Moreover, there was also a kind of polished ridged stone axe, designated as the stone axe of the Patu type by Dr Nenozo Utsushikawa and as the ridged, spoon-shaped stone axe by Dr Tadao Kano. Axes of this type have been unearthed from Yüanshan and the Botanical Garden in the Taipei basin, Shulin in the T'aoyüan tableland, and Yingp'u on the bank of the Tatu river. Similar objects without ridges have been found farther to the south. I concur with Dr Kano (1946:249) in considering these stone implements as digging or planting sticks; but I do not think that they were necessarily fitted with stick-shaped handles, for it seems possible they were held directly in the hand. But if we regard the chipped varieties also as digging or planting sticks, then wooden handles were probably attached.

In the Ryūkyūs, semi-polished, ridged-stone implements are conspicuous in the Yaeyama islands. Polishing was done to sharpen the edges. Since this stone implement is not significantly represented north of the main island of Okinawa, there are little chances that it came from the north into the Yaeyama area.

From their associated cultural inventories, the polished, ridged-stone implements of northern and central Taiwan appear to be related to the polished, ridged-stone implements of Hangchow Bay area and Foochow on the mainland; but the chipped ridged implements were not necessarily related to the mainland. Digging sticks are still used among the Taiwan aborigines.

In Yaeyama, the ridged-stone implements and the stone axes of the *bira* type seem to belong to parallel but different traditions; both have continued into the present time in the form of iron digging sticks and *bira*-like iron spades.

Semi-polished stone axes of the *bira* type have been found from the Early Neolithic period in Luzon. Among the ridged-stone implements of Luzon there is a kind of so-called 'roof-shaped' stone implement. On the Batanes a kind of digging-stick, with an iron spade attached, is suggestive of the ridged forms (Kano 1942; pl. 9) it is possible that the ridged-stone implement was their prototype.

From these facts, the appearance of the *bira*-type stone implements and the ridged stone implements is evidently related to farming cultures of a southern origin.

3. *Chipped Stone Axe of the* Chichivchiv *Type.* (Plate II)

The implement, which the Yami people on Botel Tobago call *chichivchiv*, is a stone axe with a neck in the middle. According to Yami traditions, it was used in cutting grass roots and weeding. This stone implement is seen also on nearby Itanasai islet, the southern part of the east coast of Taiwan, and on Hsiaoliuch'iu islet near the southern part of the west coast of Taiwan. In other words, the *chichivchiv* type of implement belongs to a culture area including southern Taiwan and its adjacent islets. Although not known in the Yaeyama area, it appears on some parts of the main island of Okinawa and on Kumejima. Its provenance in these places is not well established, but it probably belonged to the late prehistoric period in the Ryūkyūs. It deserves closer attention and further inquiry.

4. Boot-shaped Stone Implement and the Round Axe (Walzenbeil)

Boot-shaped polished stone implements with oblique cutting edges have been found in the Nakama shell-mound no. 1 on Iriomote. They are also known in Itanasai, the small islet to the east of Taiwan and within the sphere of the Black Current. On Taiwan many such implements, either polished or rough, have been unearthed; some clearly exhibit their boot shape. The close relationship of this stone implement in Taiwan to similar objects on the mainland, particularly in China south of Chekiang, has been noted; Professor Kanaseki and I both think that these boot-shaped stone implements were used in weeding.

Since the ridged-stone implements, the boot-shaped implements, and the *chichivchiv* type of tools have been found in the Ryūkyūs, particularly in the Yaeyama group, the existence of dry cultivation of the prehistoric Taiwan type in the Yaeyama area can be postulated. Except for the ridged implements, these types are not as significantly represented in Yaeyama as on Taiwan; but the ridged implements were more prevalent on Yaeyama than on Taiwan. The basic stone inventory of Yaeyama consists of ridged implements as well as round axes (Walzenbeil) and *bira*-type implements with polished edges.

On the other hand, on Taiwan both semi-polished *bira*-type implements and round axes are rare. The semi-polished *bira*-type implements have been unearthed at the Chushan site in the central part of the Taiwan west coast and its vicinity. At this site cist graves have also been found. This and the quartz-schist bracelets also discovered here indicate connections with the east coast. Should semi-polished *bira*-type implements appear on the east coast of Taiwan it would be of great interest, but this remains to be investigated.

The Walzenbeil is represented by the oval axes on Botel Tobago and Itanasai east of Taiwan, but without a single report of its occurrence on Taiwan east coast. On the west coast it has been found in the northern part and is among the spoon-shaped (Kano's) or the *patu*-type (Utsushikawa's) implements which have no central ridge and oval or widely oval cross-sections. The blade of the axe is occasionally spoon-shaped. The non-spoon-shaped variety is certainly within the range of Walzenbeil as the term is generally understood. The spoon-shaped axes have thin edges and are apparently earth-digging implements.

Although the wood-working stepped adzes belong to the rectangular axe group, some, such as the so-called stepped columnar adze, can also be included in the Walzenbeil tradition.

The cultural inventory associated with the stone implements of the Walzenbeil tradition in northern Taiwan suggests that its origins should be sought for in the prehistoric cultures of South China. On the other hand, both the Walzenbeil of Botel Tobago and Itanasai, and the semi-polished *bira*-type implements and Walzenbeil of the Ryūkyūs must be related to the Early Neolithic cultures of Luzon.

5. *Trapezoidal Gouge Form and the Hogback Form*

Coming to the woodworking implements, the so-called trapezoidal gouge forms were evidently used in carpentry, and the axes made of giant clam shells are similar implements. Instances of both have been reported from Ishigaki and from Okinawa. The adze with a hogback cross section seems again to be a woodworking implement; it has been found in the Yonaguni and Hateruma islands.

Trapezoidal gouge forms have been reported in Taiwan from Botel Tobago only. They were made of basalt and are finely manufactured and sharp. They are similar in shape to the iron woodworking tool, called *uma*, of the Yami islanders and may very well have served as the latter's prototypes.

The origin of the trapezoidal gouge forms is also thought to be in the Luzon area.

6. *The Stepped Adze*

The polished stepped stone adze prevalent in the Taipei basin in northern Taiwan is considered to be a woodworking implement and is associated in that basin with polished shouldered axes. The stepped adzes and shouldered axes in prehistoric Taiwan apparently originated in the prehistoric period of South China.

In the Yaeyama archipelago, roughly manufactured stepped adzes have been found on Hateruma, Iriomote, and Ishigaki. Since this type of stone implement has not been found north of the Okinawa islands, it is unlikely to have originated in the north. Its complete absence from the east coast of Taiwan and from Botel Tobago and Itanasai would rule out that the stepped adze came to the Ryūkyūs from this region. The stepped adzes from the Yaeyama islands are very primitive; that the Luzon type of stepped adze in South China served as their prototype is unlikely. It may just be that the coarsely made, handle-attached stepped adzes of the Yaeyama islands were indigenously developed.

7. *The Quadrangular Adze*

Stone adzes of quadrangular or rectangular cross section are practically unknown except on Ishigaki and Miyako. This type of implement, which invariably occurs in South China and Yayoi cultures, is found neither in the Yaeyama area nor in other island groups in the Ryūkyūs (with very rare exceptions). This is also true of stone knives. We may conclude, therefore, that neither the South China rice culture from the continent nor the Yayoi rice culture from the north appears to have come into our area during the prehistoric period.

8. *Millet-harvesting Implements: The Shell Knife*

Millet-harvesting implements are frequently made of shell. The Manobo people of Mindanao use shells today in harvesting millet; here and there in the Yaeyama islands shell is used also for this purpose. On Tunoshima in the Hibiki Nada Sea, near Japan, ear shells are used in harvesting. For prehistoric examples, objects cut from the edges of the pearl shell have been reported from Itanasai islet near Taiwan.

In the Yaeyama area, two objects made of shell edges have been reported from Shimotabaru on Hateruma. Objects with saw-shaped edges made from clam shells have been taken from the lower cultural stratum on Yabuchi, near Cape Katuren on Okinawa. These are evidently millet-cutting implements. Farther to the north, ear-shell knives have been found from Final Jōmon–Early Yayoi remains at cave sites on Umashima in the Hibiki Nada Sea.

Ear-shell knives have been found in the Bishamon cave on the Pacific coast of Miura Peninsula. These prehistoric shell tools are considered to be the prototypes of the harvesting tools used today in the Ryūkyūs, on Tunoshima, and among the Ainus.

Artifacts of shells, with the tops knocked off and the edges ground, have been unearthed from the prehistoric strata in Hengch'ung cape in Taiwan, Itanasai islet, Yonaguni, and shell-mound no. 4 of Omonawa. Shell sinkers with perforated tops have been discovered in prehistoric shell-mounds in Taiwan, Yaeyama, Okinawa, and Tokunoshima, and in Late Jōmon shell-mounds in Kyūshū. This distribution of the shell knives in the Black Current regions (Fig. 2) would indicate a movement of millet-growing fishermen.

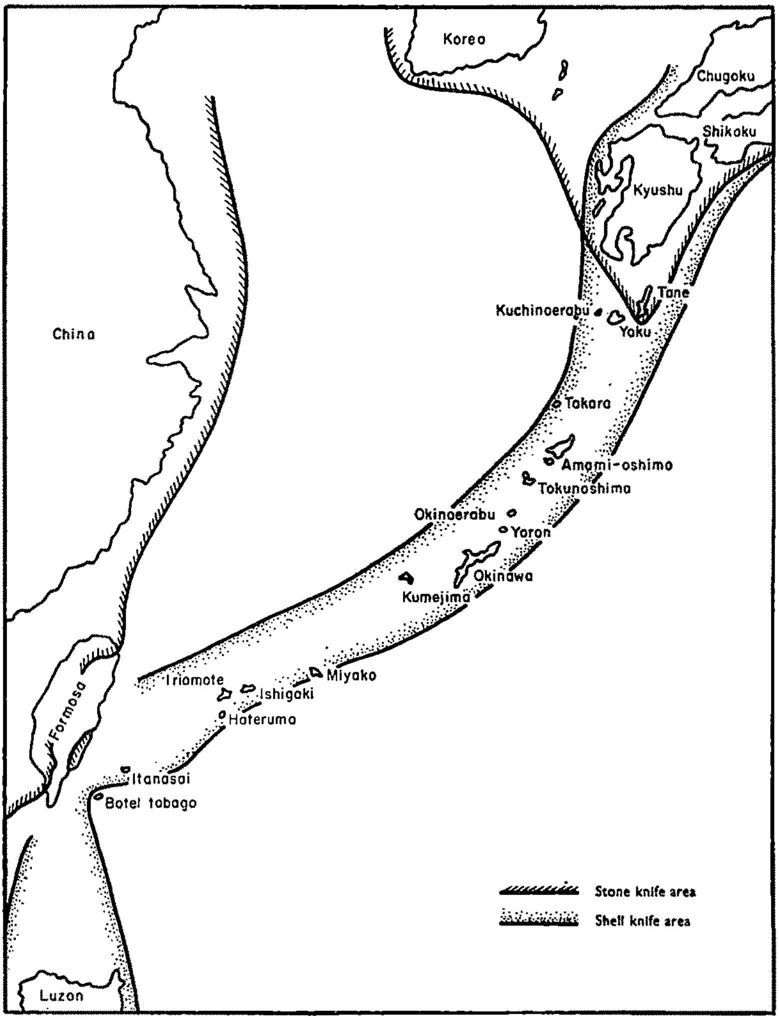

FIG. 2. Culture areas of knives.

9. *Rice Cultivation and Harvesting Implements*

Was rice cultivated in the prehistoric Ryūkyūs? A potsherd of the Yaeyama type with Indica-type rice grain impressions has come to light from the Yambaru shell-mound on Ishigaki, which is thought to date from the last stage of the Yaeyama prehistoric period. It is evident that rice of the southern system existed here during that period. Dry-land cultivation is practised at the place on this site, and probably the prehistoric rice in the same region was dry rice also.

With few exceptions, stone knives do not occur in the Ryūkyū-Amami islands. From the Katena shell-mound in Okinawa a chipped, holeless stone object of knife shape was taken.

Modern rice of the Southern Islands includes both Japonica and Indica varieties, but their origins are not clear. If the rice came here from Kyūshū, it must have come after the stone-knife period. Sue pottery, which appeared in the various places in the Southern Islands however, is suggestive in this respect, and it is possible that the Japanese rice penetrated the south in this period. Wheat is perhaps another crop that came south at the same time. The white garments worn by female shamans in the rituals performed in the woods and in their other rituals probably derive from the influence of ancient Japanese rituals after the Kofun [古墳 Ancient Tombs] period. Probably during the Nara dynasty, when the Southern Islands were officially explored and searched, these influences came into our area.

Furthermore, in the Southern Islands some techniques of cultivating wet crops are identical with those known from both archipelago and mainland parts of Southeast Asia. They reveal the absence of plow and the working of wet fields with domestic animals. How these techniques reached the Southern Islands is still unknown.

10. *Impressed Pottery*

The Sue pottery of Kyūshū tradition is not seen in the Ryūkyūs, but impressed pottery, related to the impressed pottery of northern Taiwan, has been found in Hateruma. What were the contacts between the inhabitants of northern Taiwan and prehistoric Hateruma, as evidenced by the impressed pottery, have yet to be determined; but that the impressed pottery first appeared at a later period than the Shimotabaru-type pottery is clear.

11. *T'ao-t'ieh* 饕餮 *Engravings and Animal Pendants.* (Plates IV, V)

In the animal art on the islands between Kyūshū and Taiwan in the Black Current route is an engraving motif that was possibly related to the *t'ao-t'ieh* complex of ancient China. It has so far come to light on both Okinawa and Tanegashima.

The most remarkable findings from Okinawa are the animal-shaped bone artifacts from the Kanegusuku shell-mound. They appear to be a kind of 'winged dragon', to use Bernhard Karlgren's terminology. According to Professor Hiroe Takamiya, who investigated the shell-mound, it dates to the end of the early prehistoric period in Okinawa which probably corresponds to the Late Jōmon stage of prehistoric Kyūshū. The winged-shaped objects found in association with secondarily buried bones at Hirota on Tanegashima recall the wing parts of the animal figures found in the Kanegusuku shell-mound. Decorative patterns like these are also found worked into the designs of bronze mirrors in ancient China. The Hirota burials can probably be dated to the Middle–Late Yayoi period. At this site, *t'ao-t'ieh* engraved shell objects and dragon shell pendants have been found in association with many human skeletons. With a single exception, these *t'ao-t'ieh* shell pendants were found with the skeletons of women, possibly shaman-like characters. The bones of the only male were judged by Professor Takeo Kanaseki and other physical anthropologists to be rather feminine. From these findings, androgynous shamans may be suspected (Kokubu 1963). Double-sexed shamans have been recorded in Taichu's *Notes on the Religion of the Ryūkyūs* (1605), and even now we find male shamans who wear female garments.

At the Hirota site a shell tablet incised with the Chinese character 山 *shan* (*yama* in Japanese, i.e. 'mountain') has been found with some secondarily buried bones. Professor Kanaseki told me that the character was written in the *li*-style—that is, the scribes' style of the Former Han Dynasty in China (Karlgren 1954: 193). The occurrence here of a Chinese character in ancient calligraphy is extremely interesting.

Kuo Mo-jo, the distinguished archæologist, wrote to me that the Hirota *t'ao-t'ieh* patterns fall within the decorative variations of the Warring States period in ancient China.

T'ao-t'ieh patterns have been found also, in Okinawa on bone engravings excavated from the Sachihijā, Yashima, and Katena shell-mounds, which all date approximately from the early prehistoric period of Okinawa.

Shell objects of animal shape but without engraved designs, according to Professor Clement W. Meighan and Professor Hiroe Takamiya, have been found in the Atutabaru shell-mound on Okinawa, which probably dates to the late stage of the Okinawa prehistoric period.

Some shell objects found here are shaped like the so-called 'trunked dragon' of Bernhard Karlgren, and others are rhinoceros-like animals. Inasmuch as the Ryūkyū islanders are simple farmers and fishers in an isolated area, it seems hardly feasible such animal shapes are due to their imagination and it is difficult to question an affiliation with ancient Chinese tradition.

These animal patterns or animal-like decorative designs although they disappeared on ornaments, they are found among designs for wrist tattoo on Amami-Ōshima and Tokunoshima (Obara 1947). The animal patterns in the tattoo designs must have some kind of magical significance.

At the Southern Islands, south of Okinawa, although no discoveries have been reported from Yaeyama, we have materials from prehistoric Taiwan. Mr Shushin Ozaki's collection contains objects with *t'ao-t'ieh* like patterns and cicada designs (Fig. 3). These are mixed with artifacts from Yüanshan, but they may have come originally from the Toran site on the east coast. These objects are made of quartz-schist, a stone material common to the east coast of the island. Among the findings excavated from the stone-cist graves at the K'enting site in southern Taiwan is a nephrite pendant in the shape of a human figure. Some ear ornaments discovered on Botel Tobago have comma-shaped projections. These materials from Taiwan

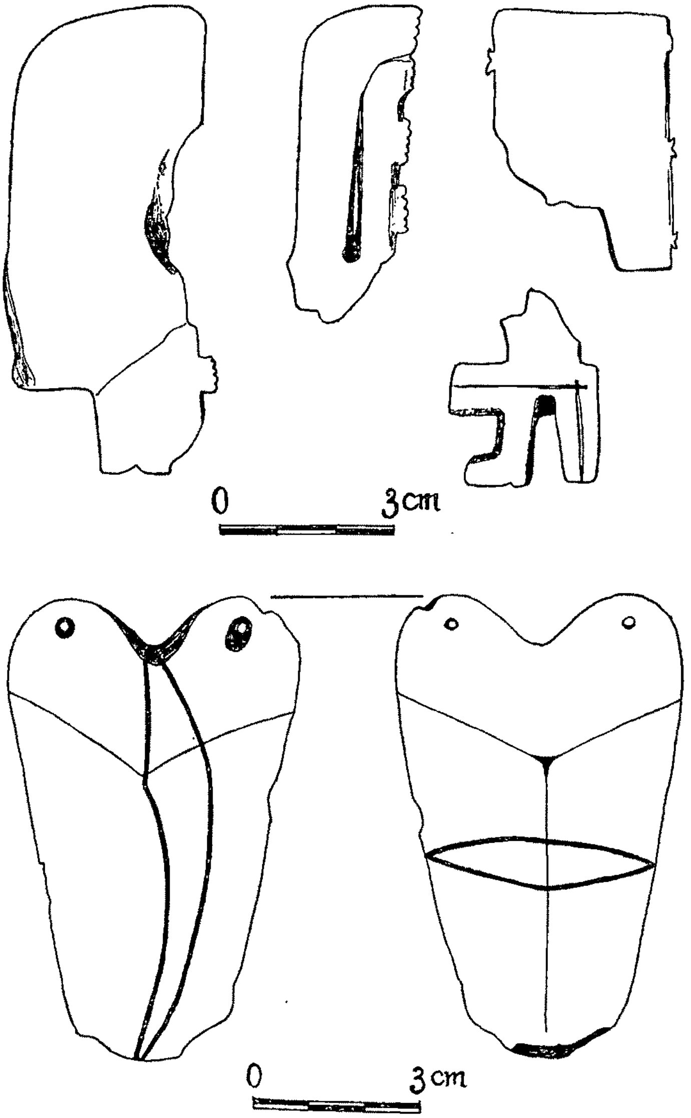

FIG. 3. Quartzschist objects in the S. Ozaki collection. They show a close resemblance to the quartzschist objects from Toran, in T'aitung prefecture, on Taiwan's east coast, where it is possible Mr Ozaki collected them. The comma shapes and the peculiar figures on these objects are worthy of attention. See Plate IV*b*.

appear to belong to a relatively late age, but both the Taiwan finds and the Ryūkyū finds have their origins in South China seems clear enough.

12. Bronzes and Arrowheads

Ming knife-coins have been discovered in the Gusuku-dake shell-mound in prehistoric Okinawa. This type of knife-coin is known from Luanp'ing in Jehol to southern Manchuria and has been reported from the Liaotung peninsula and Korea, which shows widespread influence of the cultures on the northern frontiers of China during the end of the Warring States [戰國 403–221 B.C.] period. That the knife-coins occurred at Gusuku-dake, outside the city of Naha, indicates that this influence reached the islands to the east of the East China Sea. No other bronze artifacts in the East China Sea area are known, but recently a bronze arrowhead of the Hsiaot'un type (with two wings, long shaft, and solid stem) has been recovered from the Yüanshan stratum at the prehistoric site at Tap'enk'eng in Pali district, Taipei prefecture, Taiwan. [See Liu Pin-hsiung, page 217 in this issue.] I visited the site in April 1963 in the company of Messrs Liu Pin-hsiung, of Academia Sinica (under the auspices of which the site was excavated) and Liu Chih-wan. Liu Pin-hsiung dates the find to the Warring States at the latest. The *Ming* knife-coin from Gusuku-dake and the bronze arrowhead from Tap'enk'eng bear witness to the ancient civilizing influences of China in islands east of the East China Sea.

The prehistoric life as seen from the evidence of the Gusuku-dake shell-mound shows little change from that at such older shell-mounds as Iba and Ogidō; the decorative designs on pottery have however become somewhat simpler.

Other things in prehistoric Okinawa indicate ancient Chinese elements. In May 1960, Mr Masahide Takemoto of the Koza Central High School of Okinawa and I made a trial excavation in a cave site on the island of Yabuchi, near Cape Katuren of Okinawa, and obtained interesting data. There are two culture-bearing layers at this site: in the upper stratum we found high-fired, red potsherds; in the lower stratum black potsherds with thin walls, fired with low heat, and tempered with sand. Among the many arrowheads we found many were made of shell, and a few from bone. Some appear to be related to bronze arrowheads, such as the diamond-shaped, stemmed type, the elongated triangular type, and the stemmed, willow-leaf-shaped type. This last kind has identical counterparts in northern Kyūshū and prehistoric South Korea; it has also been found in the southern part of the west coast of Taiwan in association with black pottery. Since it is a form occurring in South China, it probably came into the southern part of the Taiwan west coast from South China together with black pottery. Among the arrowhead types of the Yabuchi island, southern Chinese forms also occur.

Nine chipped, stemless arrowheads of chert or obsidian have come from the Gusuku-dake shell-mound and two of this kind from Itoman Street, both on Okinawa. They resemble the stemless arrowheads of western Japan, ranging from Jōmon to Yayoi in time, and may very well be related to the latter. Thus arrowheads of both the South China and Kyūshū traditions occur in Okinawa.

Chipped, stemless arrowheads have been known from the Chienshan site, on the eastern bank of the upper Hsintien river in the Taipei basin, but they are very rare exceptions. Their relationship with the similar arrowheads of Okinawa of western Japan type cannot be established.

13. The Megalithic Culture

Megalithic structures of the prehistoric period have been found on the Taiwan east coast. Excavations undertaken at the stone pillar remains at Peinan, near Taitung, show clearly they are stone-house remains. Stone pestles and what can probably be called stone pig-feed containers were found together. The east coast has rock-cut coffins of prehistoric periods.

When Dr Erika Kaneko and I were investigating Yaeyama in 1961, we found at old houses huge stone posts cut from coral reefs. Below a cliff-burial area, known as the *kusa no kan no daya* (house of the grass spirits), we discovered rock-cut coffin-like stone objects. The culture of the east coast of Taiwan, so far as it concerns stone houses and other stone structures, appears in at least a part of the Yaeyama area.

Heine-Geldern thinks that the megaliths had for function a magical virtue of promoting fertility. The *bijil* (menhir) and stone platform of the Ryūkyūs seem to serve as a sacred place as well as the centre of the village life, and are known as *ugan* or *utaki*. Ancestral spirits move with the *bijil* as a base, which is also the locus of feasts to the ancestral spirits. Cattle are often used in Southeast Asia rituals; and pigs in the Ryūkyūs. The ritual uses of different animals are probably related to beliefs concerning agriculture and domestic animals.

14. Wild and Domestic Animals

Although our discussion has chiefly dealt with archæological remains, wild game and domestic animals, which were important to prehistoric man, also throw light by their distribution on the historic relationships of the islands on the southeastern margins of the East China Sea area.

The earliest animal in the Ryūkyūs, which may have existed here in the Pleistocene, is the deer. Tokunaga (1938) found among the fossil deer bones in the fissures in the coral reefs at Iejima some with artificial perforations; but whether they derive from Pleistocene deposits is undeterminated. In the Shuri Museum, Okinawa, I saw semi-fossilized deer bones unearthed from the Uhji cave near Chinen village; definitely they were broken by man and probably discarded after eating. In the clay attached to some of these deer bones can be seen very fine fragments of pottery and charcoal grains. These are evidently not nearly so early as the Pleistocene but can probably be dated to the beginning of the prehistoric period on Okinawa. An ashy layer lies above the stratum bearing deer bones, and on top of this is a cultural stratum containing Iba-style pottery—the bottom layer can thus be roughly dated. Whether the Uhji and the Iejima deer were of the same variety is still unclear but, according to Dr Senba, the Uhji deer is identical with the Yaku deer now living on Yakujima—that the Yaku deer existed on Okinawa is of interest indeed. It differs from both the Japanese and the Formosan deer, and probably became extinct on Okinawa early in its prehistoric period. Its former presence here would indicate that the Yaku, which is now adapted to the vast and mountainous Yakujima, at that time had a wider distribution in suitable environments.

Pig remains have been found in many shell-mounds in the Amami-Ōshima islands. Since pig bones are not found in Pleistocene deposits, apparently the pigs of the shell-mounds were introduced. The wild pigs on Iriomote island and other islands the size of Okinawa, are possibly derived from the domestic pigs. How the pig came into the prehistoric Ryūkyūs will only be known by a comparative study of the native pigs of the various regions of Southeast Asia.

Some of the Okinawa pigs were introduced from China in recent centuries. According to Mr Fuyu Iba (1938), who has collected oral traditions, indicate that pigs came from Shantung province in the beginning of the Ming Dynasty. But among the immigrants of the early Ming Dynasty, the so-called Thirty-six Families came from Fukien, and through them probably the pigs and pig-raising techniques of South China were then also introduced. Toward the end of the 15th century, fishermen from Chejudo (Quelpart island) who had drifted to Yonaguni, on their return home reported that on Okinawa there were cattle, horses, pigs, and goats, but that there were no privies, and defacation was done in the fields. If so, the pig-raising techniques, related to the construction of toilet shacks, were only introduced after contacts with South China during the Ming dynasty.

However, on Botel Tobago pigs were fed on the excretions in the fields. The Formosan Chinese also practised field excretion before the toilet shacks became popular, and probably they also fed their pigs in the same way.

Taro and other feeds were boiled, placed in troughs, and prepared with a crusher; the pig-troughs and the crushers used by the natives of Luzon, the aborigines of Taiwan, and the inhabitants of the Southern Islands are similar in form, and this may give a clue to the distribution of pigs with small bodies like the wild ones.

Small horses such as the Miyako pony and the Tokara pony are found all over the Ryūkyū. The same horses are also seen on Cheju-do. Their presence in the prehistoric Ryūkyūs is witnessed by the discovery of small horses in the Jiarabaru shell-mound on Okinawa. Similar small horses are also found in prehistoric Japan. Their northern limit is suggested by the findings from the Late Jōmon stratum at the Yoyama site in Chiba prefecture. The situation in prehistoric Taiwan is not clear, but Huang Shu-ching's *T'ai Hai Shih Ch'a Lu* 臺海使槎錄 records the occurrence of small horses in Taiwan, and the existence of 'mountain horses' in the interior mountains is documented. The *kuo-hsia* 果下 horse in ancient South China was a kind of small horse. The fact that the typical small horses are found today in the mountainous regions of Szechwan, Yünnan, and Kweichow and are known here as the Szechwan pony, suggest that the hilly regions on the periphery of South China were probably the homeland of the small horses on the mainland. But their modern distribution is extended to Annam on the Indochina peninsula and to Luzon, Celebes, Sumatra, Java, Lombok, Soemba, and Timor in the inland areas. The question now is from what part of East Asia was the small horse introduced into the region from the Ryūkyūs to Japan.

The small black-, white-, and brown-spotted goats that are now found in the Philippines, Botel Tobago, Yaeyama, and Okinawa and which are known to have existed on Yakujima, are apparently of Philippine derivation, but as their bones have not been found in prehistoric shell-mounds in Amami-Ōshima, they were probably introduced by relatively recent seafarers.

The distribution and genetic relationships of domestic animals can throw light on the genetic relationships between their human domesticators, but a thorough comparative study of domestic animals in East Asia is a feast for future investigators.

15. Tooth Extraction, Tooth Deformation, Tattoo, Betel-nut Chewing, and Tooth Blackening

Tooth extraction evidence has been found in the relatively recent cliff burials on Tokunoshima, Ishigaki, and Yonaguni. The custom seems to be of rather late date in this area; it also occurs in Hirota on Tanegashima. From burials of the Middle–Late Yayoi period there, forty adult jaw bones have been completely restored. Among these, 31 show evidence of tooth extractions, and probably this custom can be traced back to the Hirota period. It is interesting to note that some of these features resemble those of the aboriginal Indonesian peoples on Taiwan (Nagai 1961).

Examples of horizontal cutting of teeth come from the Final Jōmon stage site at Nagasaki-bana on Tanegashima—this custom of deforming teeth existed among the Philippine natives.

Sharpening the teeth into points is another custom. Its presence in prehistoric Japan has been established from the Late and Final Jōmon shell-mound at Ikawatu, Aichi prefecture.

Tattooing is widely found in the Amami islands of the Ryūkyūs, and was known in ancient Japan. The 'Biography of the Wo People', in *Wei Chih,* records that the inhabitants along the coast of Bodo Wan in the third century 'tattooed their faces and bodies to avoid injuries from snakes'. Among the human figurines from prehistoric Japan is a group with symmetrical lines incised on the faces. These are dated to the Middle and Late Jōmon periods, and this has been interpreted as indicative of the custom of tattooing. It is also noted among the inhabitants of ancient China, and is a prominent feature in the Philippines.

Chewing betel-nut is widely practised in South China and in both the mainland and the island parts of Southeast Asia. The prehistoric human skeletons found at K'enting in Taiwan bear also evidence of betel chewing, but the custom is not practised in Japan and the Southern Islands outside the area of betel tree distribution. In the mountain regions of Taiwan betel trees are few, and some bear no nuts; here again the custom did not arise; but the natives extract the juice from some tree to colour their teeth. In Japan there is a closely similar practice.

The customs of tooth deformation, tattoo, betel-nut chewing, and tooth blackening probably should not be considered singly, since they appear to form a whole complex, which has persisted in the East China Sea area from prehistoric times.

16. Head Deformation

Among the skulls found in the Hirota burials on Tanegashima, one was evidently deformed by a head-band. There are roundish impressions on the forehead and grooves on the sides of the skull. This skull belonged to a male skeleton which, however, shows female characteristics. The types of ornaments that have been found with female shaman skeletons were found with this burial, and it is postulated that this was a double-sexed shaman (Kokubu 1963).

Shell ornaments found near the foreheads of skeletons in some of the female burials are band-shaped—probably headdresses made of shells.

Some features of these customs are shared by the native peoples in the south.

From the Yayoi-stage skeletons in Kyūshū, impressions on the forehead made by carrying-basket bands have been noted and indicates in prehistoric Japan a portage technique identical with that of Taiwan and the islands in the south.

17. Double Burials, Multiple Burials

The custom of collecting the bones some time after the initial burial is widely distributed in South China, Taiwan, and the archipelago part of Southeast Asia. In the Southern Islands this is also seen in the entire area of the Amami islands, and it extends as far north as Izu Ōshima. In Japan proper it has been noted in Kyūshū and Chūgoku, and South Korea also had the same custom.

In the prehistoric Southern Islands, the secondary burials found at Hirota on Tanegashima are the most remarkable. Evidence of secondary burial is known from Late Jōmon sites, reaching as far north as the northern part of Ōu. The modern double-graveyard system peculiar to the central part of Honshū was probably derived originally from the secondary burial (Kokubu 1963).

Intensive investigations of the secondary burial custom in the Ryūkyūs and Japan proper show that the second burial by no means marked the end of the burial rites. The bones, freed from decomposed flesh, received sacrifices as the loci of ancestral spirits, and many last rites were then involved. This is the multiple burial system; I have not yet come across any data on the third burials in the East China Sea areas.

IV

Finally, some concluding remarks. According to Professor Otley Beyer, in northern Luzon there are aboriginal peoples of the Ainu type. Professor Takeo Kanaseki has discussed the physical relationship between these aborigines and the inhabitants of the Southern Islands. Stone implements closely resembling the farming implements of the Early Neolithic of the Philippines occur significantly in the Yaeyama islands as well as in prehistoric Japan. They occur in some of the early sites in Kyūshū, and in later sites. The relationship of the prehistoric Ryūkyūs with the South cannot be denied, and southern influences apparently reached as far as Japan proper in prehistoric times.

We may also postulate that, in the course of migrations from the Philippines, Taiwan was sometimes reached, and settlements were established here. In such cases, the migrants settled in this relatively large island, and further expansions into the small islets ceased.

The movements from the south toward the Ryūkyūs must have taken place during a fishing-shifting-farming stage prior to the establishment of sedentary cultivation. This course was likely by way of the islands east of Taiwan, and Taiwan itself was probably bypassed, even though contacts with the eastern and northeastern coasts of Taiwan must have taken place.

Much about the cereal cultivation in the Ryūkyūs is still unknown, but apparently millet appeared on Yaeyama during the prehistoric period.

In prehistoric Taiwan cultural influences came both from the south and from the mainland. Accordingly, prehistoric Taiwan served as base for the highly interesting composite culture in the East China Sea area, a culture composed of elements of both insular and continental traditions.

The southeastern part of the mainland was the base of the powerful culture that extended to various regions in the East China Sea area deep and far-reaching influences. Even though this region and the Ryūkyūs are fairly distant, contacts clearly were not lacking.

Kyūshū and the large islands to its south, such as Tanegashima and Yakujima, were the base of the northern culture of the Southern Islands. It is difficult to explain why people should move from the Kyūshū area into the Southern Islands where the living conditions were poor. Relevant to this are the contacts between the Kyūshū area and the Southern Islands. Probably there was no intensive migration from the north, like the northward migrations of the islanders.

Since the typological development of the prehistoric pottery in Japan has been well formulated in chronological stages, wherever the prehistoric pottery is found, the time depth of the cultural layers can often be determined.

The appearance of impressed pottery on Hateruma can be dated to the late prehistoric period of Yaeyama. The remains on Ishigaki with 豆 *tou*-shaped pots and 鼎 *ting* tripod feet are discoveries attributable to the late stage. During this stage the late prehistoric pottery of Okinawa appeared on Yaeyama, and the late prehistoric pottery of Yaeyama reached Tokunoshima of the Amami group by way of Okinawa. Although Sue-type pottery appeared in the late prehistoric period of the Amami group, it has recently been established that the late prehistoric pottery of Okinawa and Amami occurred on Takarajima in the Satsuman group in association with Yayoi-type pottery. Furthermore, the time range of the Ryūkyū prehistoric pottery is indicated by the finding of late Jōmon pottery from the southern part of Cape Satuma.

Southern Chinese elements such as the *t'ao-t'ieh* engraved pendants and the animal pendants occurred in the early prehistoric period on Okinawa and in the middle and late prehistoric periods on Tanegashima. The time range of the appearance of such cultures is thus indicated. These patterns survived in subsequent periods among tattoo designs, suggesting a rather strong persistence of the southern Chinese traditions in this area.

In prehistoric Japan, dragon-like animal shapes or forms derived from them have been found from late Middle and late Final Jōmon sites in the Tōhoku area. Related also to this tradition are the *magatama* beads persisting from Late Jōmon through the Kofun 古墳 period. The time range of this tradition appears to be unexpectedly long.

It is difficult to imagine, however, that such animal shapes or their derived forms in prehistoric Japan proper came by the same route which took this tradition to the Southern Islands. Such objects probably also came into Taiwan quite separately.

Tooth extraction is a Late Jōmon custom in Japan, and it is therefore possible that it could have existed in the Southern Islands as far back as the early prehistoric pottery period at the latest.

Tattooing is another custom that occurs in the southern part of the East China Sea area. The archæological determination of its occurrence is difficult, but it apparently has been in existence in the Southern Islands and in Japan proper since prehistoric times.

The secondary burial custom which is substantially represented in the southern part of the East China Sea area is widely noted from the Southern Islands. It extended farther east from Kyūshū, but changed into the double graveyard system.

From the evidence given here, the historic connections between the Southern Islands and the various regions of the East China Sea area are clearly extensive and significant and yet fishing and shifting-farming cultures have persisted on most of the islands, and exhibit insular characteristics. The navigational seasons are limited in this region, and the Islands' productivity is generally low because of the thin topsoil on the islands. These physical factors in large measure would account for the cultural characteristics of this area.

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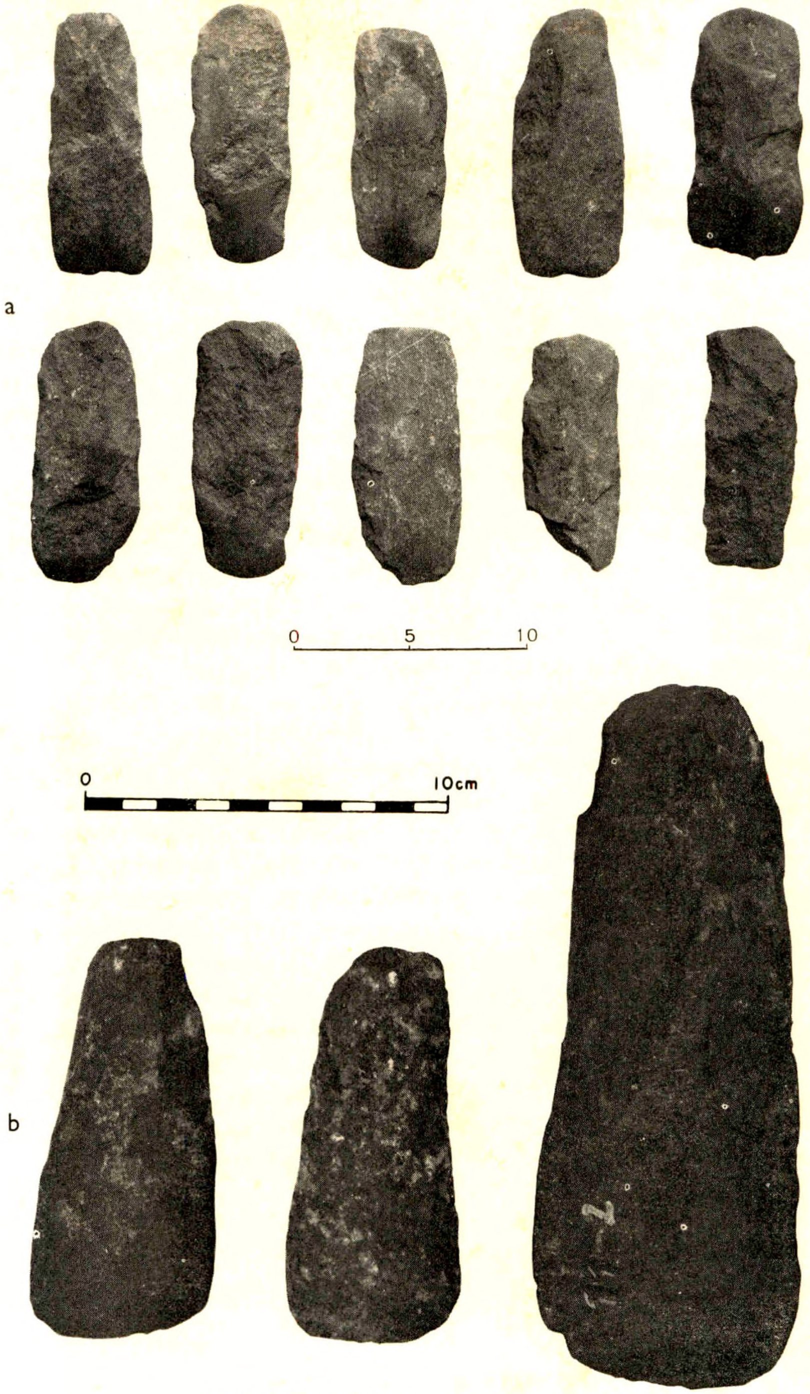
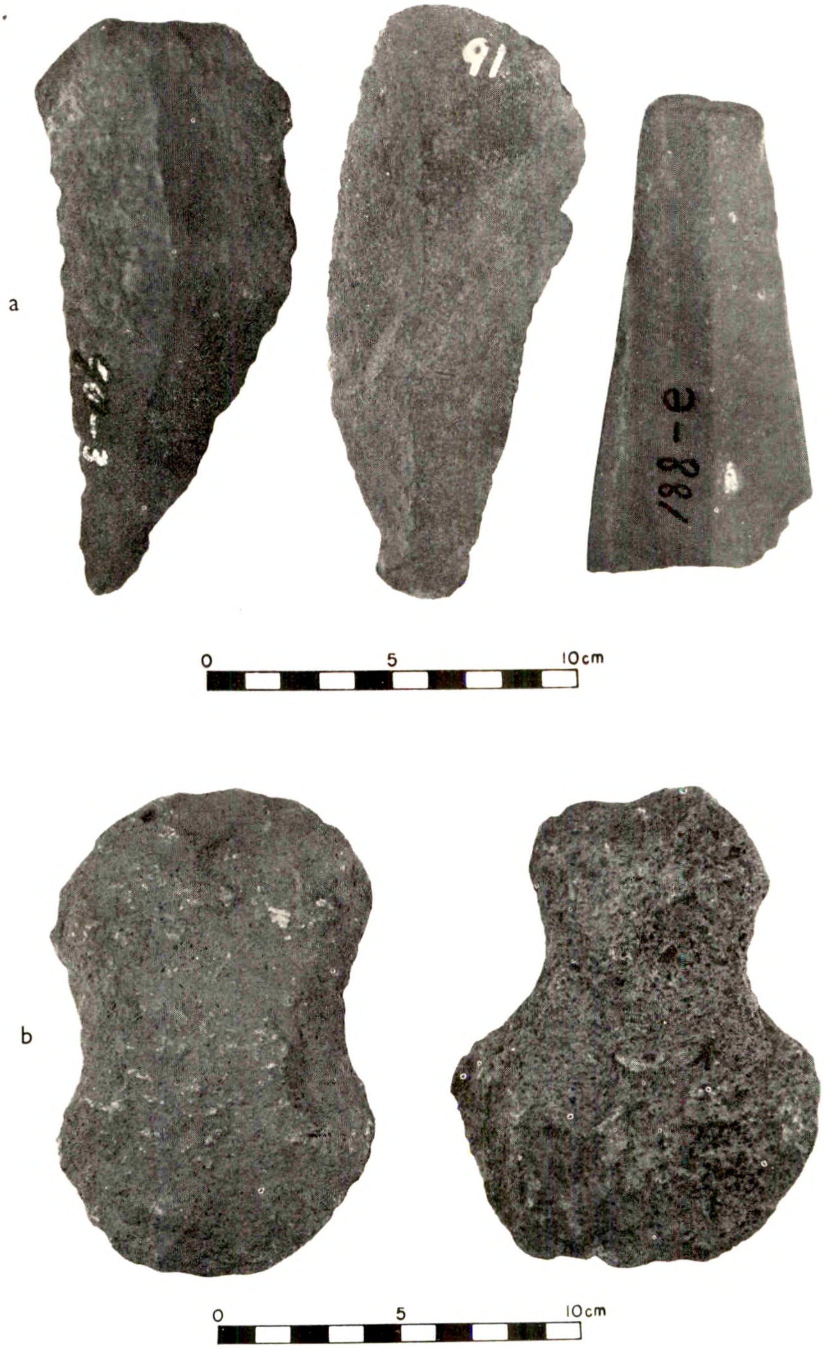


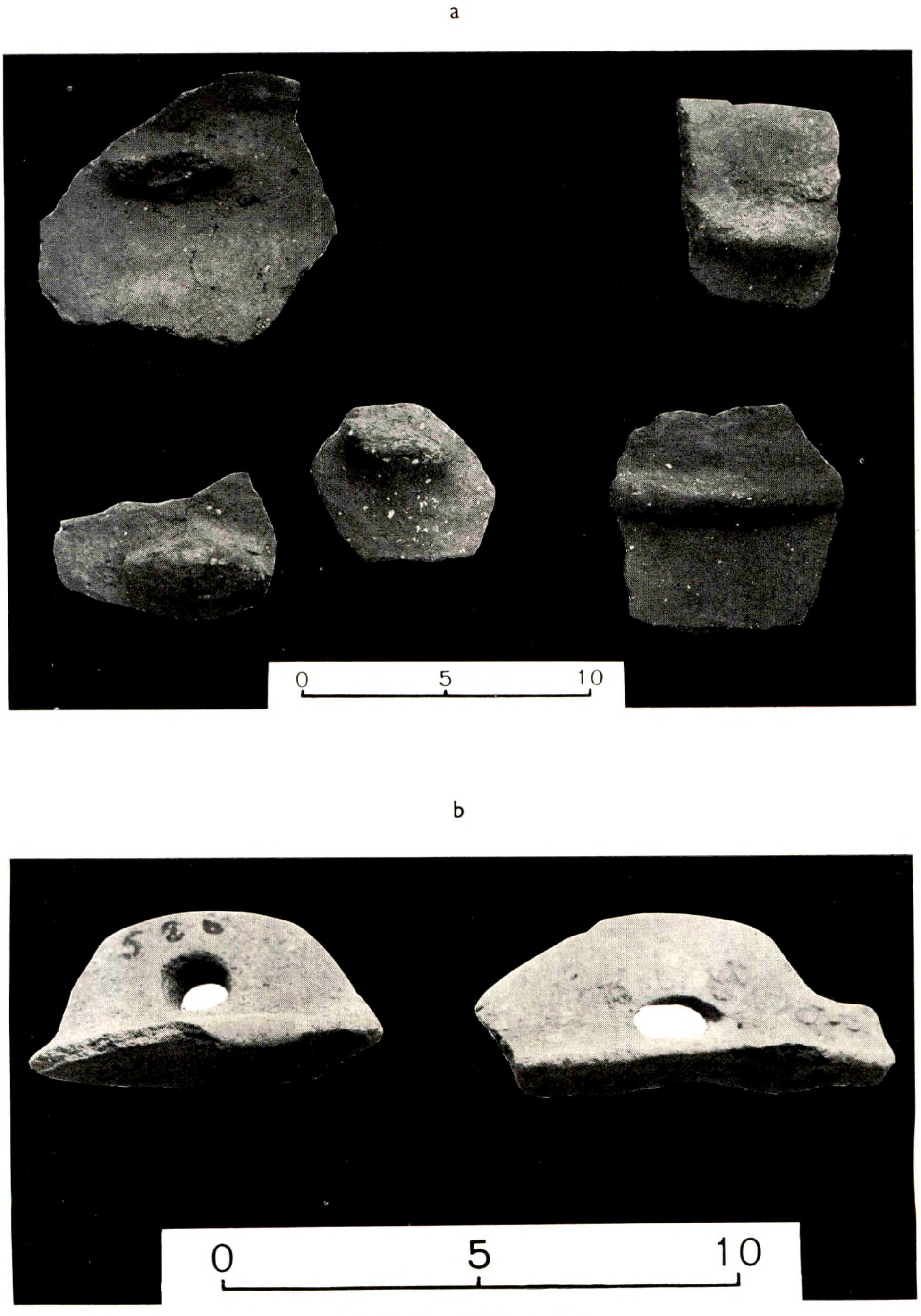
Half-polished stone axes (See pages 228–9)
a. *Bira* type from Shimotabaru, Hateruma.
b. From Chushan, Formosa.



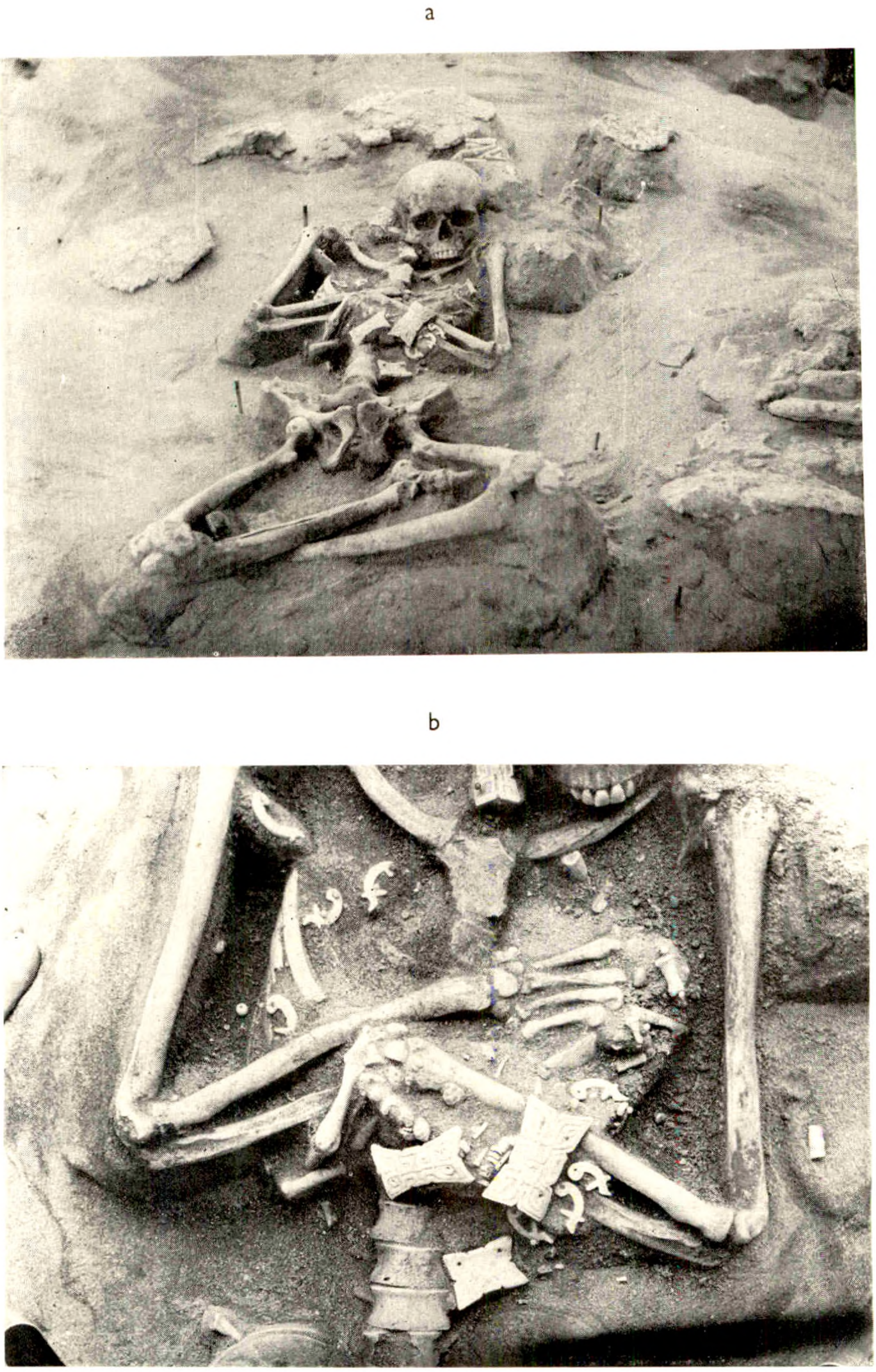
Edged and chipped stone implements.

a. Edged stone implements (left and middle, chipped stone implements from Ts'aolo, Hsinchu prefecture; right, polished stone implement from Yingp'u, T'aichung prefecture).

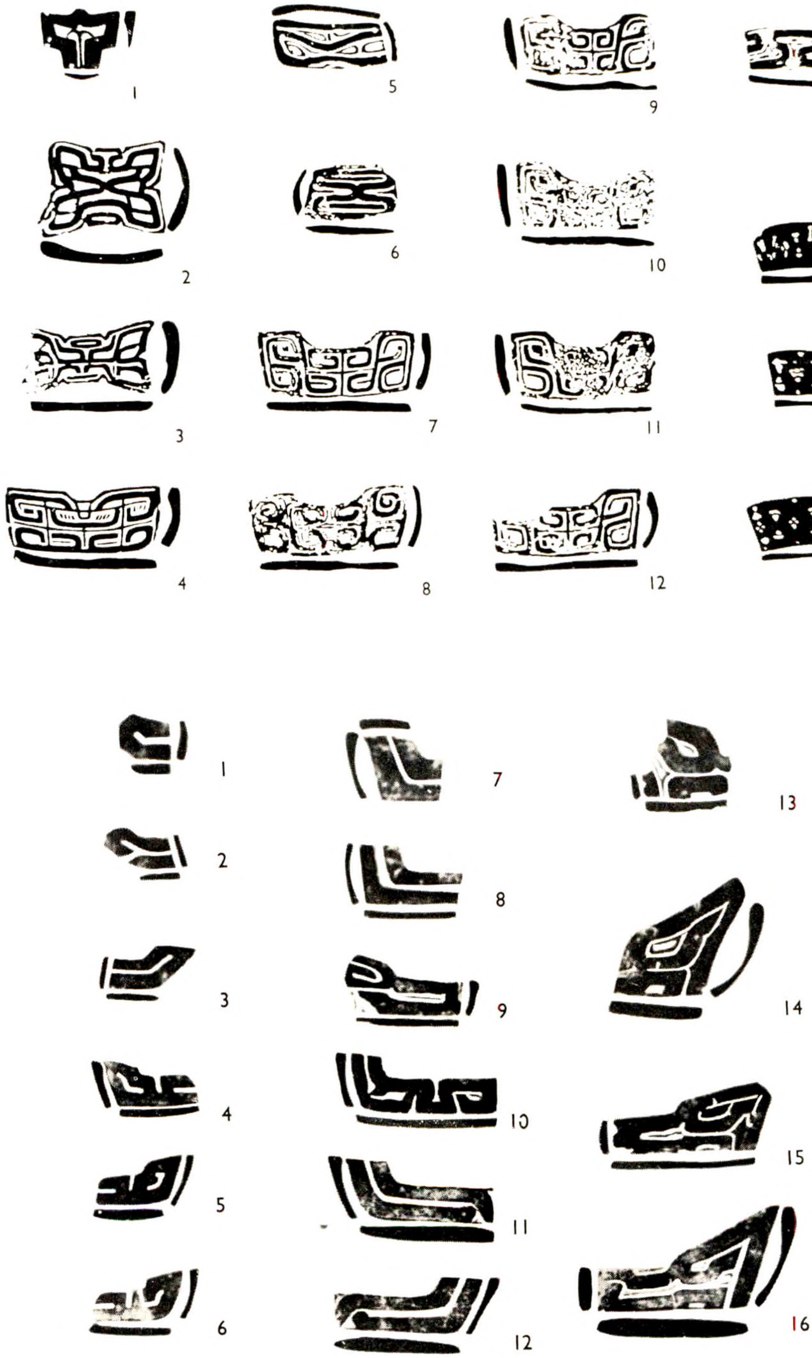
b. Chipped stone implements, *chichivchiv*, from Botel-Tobago island (See page 231)



Lug handles of potsherds.
a. from Ishigaki island (See page 128)
b. with perforations from T'aitung area, Taiwan.



A male shaman buried in female attire, excavated from Hirota, Tanegashima.
a. Whole view. *b*. Closer view of the chest region, showing *t'ao-t'ieh*-like objects and dragon pendants (See pages 233, 235)



T'ao-t'ieh-like objects from Hirota, Tanegashima (See page 233)
Upper: Objects associated with female shaman burials.
Lower: Objects associated with secondarily buried bones.

5

Prehistoric Ceramic Horizons in Southeastern China and their Extension into Formosa

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INTRODUCTION

Archæologists familiar with the prehistoric cultures of both Taiwan (Formosa) and the Chinese mainland have long agreed (despite the fact that the modern aboriginal cultures on the island are affiliated with the native cultures of Malaysia to the south) that much of its prehistoric culture was essentially an offshoot of that on the Chinese mainland to the west (Kanaseki 1943; Kano 1946, 1952; Chang 1954). Their conclusions were based on comparative studies of the characteristic features of individual artifacts; only rarely were they supported by stratigraphic evidence and distributional studies of cultural characteristics in established cultural contexts. Indeed prehistoric cultures of the southeastern coasts of China were not well known archæologically until recent years. Cultural similarities between Formosa and North and Central China are well indicated, but in the regions on the mainland closer to Formosa—the Huaiho, Lower Yangtze, and southeastern coastal provinces—such similarities were not clearly demonstrated until the last decade. For instance, by 1959 over two hundred prehistoric sites have been located in Kiangsu and twenty-one were fully excavated (*Kao-ku-hsüeh pao* 1959); by 1957 'scores of sites' had been identified in Chekiang (*ibid* 1957); and by 1959 more than eleven hundred 'neolithic' sites became known in Fukien (*Kao-ku* 1959). As early as 1956, no less than seventy-four neolithic sites had been named and described on the Kwangtung coast east of the Pearl delta, excluding Hong Kong (*K'ao-ku t'ung-hsün* 1956, 1957; *Wen-wu ts'an-k'ao tzu-liao* 1956, Maglioni 1938; Jao 1951). With the information from these archæological sites, many aspects of the prehistoric cultures in southeastern China are now much better known than before, and this has a great bearing upon the problems concerning the Formosa-Mainland relationship during the prehistoric period. In this article the prehistoric ceramic horizons of the southeastern coastal provinces of mainland China (southern Shantung, Kiangsu, Chekiang, Fukien, and Kwangtung east of the Pearl delta) are described and characterized, and attempt is made to show that some prehistoric assemblages on the western coast of Taiwan categorically belong to the same cultural sphere as the mainland, in a similar chronological sequence.

A ceramic horizon is formulated in archæology according to the occurrence of similar forms and decorative styles of pottery over a wide area during comparable time levels in each of the local sequences of culture within the area. In the case of Southeast China, where absolute chronologies are seldom available for prehistoric cultural remains, the time determination is usually accomplished by means of typological comparisons of ceramic features, stratigraphy, and comparison of cultural contexts. Generally speaking, the formation of ceramic horizons may be accounted for by different factors such as cultural radiation, trade, warfare, and ethnic migrations. According to our current knowledge of Chinese prehistory as a whole, the formation of prehistoric ceramic horizons in Southeast China cannot be described meaningfully without a brief account of the ceramic horizons in prehistoric and early historic North China, since the former were extensions of the latter in several different senses.

The Neolithic and Bronze Age development of early cultures in North China, as currently understood (Chang 1963*a*) gave rise to the following successive ceramic horizons: *(i)* Corded Ware Horizon, characterized by hand-made pottery with cord-, mat-, or basket-impressions; probably made by the earliest farmers in the area and confined to the Nuclear Area (the confluence of Huangho, Fenho, and Weishui); *(ii)* Panshan Horizon, characterized by cord-marked pointed-bottomed jars and round-bottomed vessels with painted, realistic designs of animals and fish as well as simple geometric patterns, probably of the farmers having achieved a primary village-efficiency but still confined to the Nuclear Area; *(iii)* Miaotikou I Horizon, with characteristic flat-bottomed bowls and beakers painted in geometric patterns, apparently beginning to spread toward the periphery of the Nuclear Area; *(iv)* Machiayao Horizon, a local development in eastern Kansu; *(v)* Proto-Lungshan (Miaotikou II) Horizon, characterized by the decline of painted pottery and the significant occurrence of *ting* 鼎 and *chia* 斝 tripods, pedestals, and grey and black ware, indicative of an explosive expansion of the Nuclear Area farmers into the eastern alluvial plains of North China; *(vi)* Lungshan Horizon, marked by the disappearance of ceramic painting and the extensive development of tripods, pedestals, and paddle-and-anvil technique of pottery manufacture, as well as the appearance of several local styles, such as the *li* 鬲 tripods and checker-impressions in Honan and the use of potter's wheel and the black eggshell pottery in Shantung; *(vii)* Shang and Chou Horizons, of the historic Bronze Age civilization.

These ceramic horizons of prehistoric and early historic North China had different areas of geographic distribution, and varied in their respective extension or influence in the southeastern coastal areas (Chang 1959, 1963*a*, *b*). The Corded Ware Horizon of North China may be related to the sub-neolithic cultures of the Chinese Southwest, which extended into the southeastern coastal area along the northern coasts of the South China Sea. The subsequent Panshan and Miaotikou I Horizons, representing the first farmers of the Nuclear Area of North China, apparently were confined to that region. The Machiayao Horizon was localized in Kansu. The Proto-Lungshan (Miaotikou II) Horizon, however, being a stylistic expression of an expanding village farming phase with conspicuous signs of population explosion, was brought into the southeastern coasts and the eastern low country of North China; the southeastern coast at this stage in its early culture history apparently received the first significant infusion of immigrants from North China. The Lungshan Horizon that subsequently grew in North China on the basis of the Miaotikou II substratum in the form of several local phases apparently had merely sporadic influences upon the southeastern coasts. The cultural horizon of the latter areas—the Lungshanoid—that came about as the result of Miaotikou

II immigration, apparently continued and was transformed (under the influences from the Shang and Chou ceramic horizons radiating from North China) into a new Geometric Horizon.

Thus, the prehistoric ceramic horizons of the southeastern coasts of China—the Corded Ware, the Lungshanoid, and the Geometric—apparently were the result of different historic factors. The prehistoric ceramic sequence of Taiwan must also be viewed with these factors in mind.

THE CORDED WARE HORIZON

The first known ceramic horizon of the southeast coast, characterized by red and gray pottery with impressed cord marks and invariably associated with chipped and partially ground stone implements—either the pebble hand-axes of the Hoabinhian tradition or the flake-and-blades or both—is confined, according to the available archæological evidence, where, at its western end, it adjoins the Chinese Southwest and Northern Vietnam and Laos, the classical centre of the Hoabinhian-Bacsonian. Chipped stone axes and coarse, cord-marked potsherds, that have been found as far east as Hsichiaoshan in Nanhai county on the Pearl delta, Hong Kong, and the Haifeng [Hoifung] area, seem to be affiliated with the sub-neolithic cultural assemblages to the west. The vast territory of the rest of Southeast China—the entire middle and lower Yangtze east of the Three Gates Rapids area in westernmost Hupei, the Huaiho valley, and the southeastern hills and coastal valleys of Chekiang, Kiangsi, Fukien, and most of Kwangtung—has not yielded so far any remains of this ceramic horizon; this negative evidence favours the horizon's western derivation.

Kano Tadao (1952: 176–7) has long suggested, on grounds of distribution, that corded ware and chipped stone axes were among the remains of the oldest cultural stratum on Formosa. His hypothesis has since been borne out by stratigraphical evidence that, at many stratified sites on the western coast of the island, the lower strata often contain corded sherds and chipped axes—although the reverse is not always the case, which indicates that the Corded Ware Horizon may on this island have been a long-lasting ceramic tradition as well (Chang 1954, 1956).

The propinquity of Formosa to the southern periphery of South China, where similar archæological assemblages of the Corded Ware Horizon are found, makes it probable that its Corded Ware Horizon was an eastern offshoot of the Corded Ware Horizon of the southwest. That a connection might exist between this early ceramic horizon and the Jōmon cultures of Japan our present data does not clearly show, though *jōmon* 繩文 means 'cord marks'. Aside from this feature of surface treatment, the potteries of the Corded Ware Horizon on Taiwan and of the Jōmon have little else in common.

The cultural make-up of the Corded Ware Horizon is not altogether well known, because the few sites excavated on the island cannot claim to be representative of this horizon. At the time of the Yüanshan shell-mound excavation in 1952, my opinion was that Yüanshan I, or the lower stratum of the site, substantiated Kano's corded ware cultural stratum (Chang 1954), but of this I have become increasingly doubtful. From Yüanshan I, in addition to cord-marked sherds, came ring-footed vessels with form, decoration, and paste closely resembling some ceramic wares of the so-called Ch'inglienkang culture in Kiangsu, a local variety of the Proto-Lungshan Horizon that did not become well known until six or seven years ago. Whatever Yüanshan I may have been, it is unlikely that it was a typical assemblage of the Corded Ware Horizon which originated in the west.

Lungshanoid Horizon

The first ceramic horizon that appeared in the prehistoric sequences throughout the southeastern coastal provinces of China is the Lungshanoid, thus named by myself after the Proto-Lungshan and Lungshan Horizons of North China, with which this southeastern ceramic horizon shares many characteristic features (Chang 1959). The Lungshanoid ceramic horizon of southeastern China is characterized by ceramic painting, *ting* tripods, basins and dishes on high pedestals which are often perforated (cut out), *tsun*-shaped mouth, *kuei* tripods, pottery lid, and concentric rings on pottery reminiscent of the rings on bamboo (Fig. 1). Usually associated with the ceramics of the Lungshanoid Horizon are rectangular adzes of stone, perforated flat stone axes, remains of rice, and habitations on piles or on mounds, either natural or artificial.

Numerous sites of the Lungshanoid Horizon are found in the Huaiho valley of southwestern Shantung, northern Kiangsu, and the Lower Yangtze valley of southern Kiangsu. The sites of this region are usually grouped under the term, 'Ch'inglienkang Culture', after the type site at Ch'inglienkang, in Huaian county, northern Kiangsu. South of the Yangtze delta only in sporadic sites do we find Lungshanoid remains. These sites include the lower stratum of the Liangchu site in Hangchow, Chekiang; Changp'u in Fukien, and as far south as Hsishak'eng (so-called SOW) of Haifeng; and the Lamma island in Hong Kong. This horizon undoubtedly reflects a sudden expansion of the Proto-Lungshan farmers into this riverine and coastal area, hitherto unfarmed, since the features which characterize this ceramic horizon appear to be identical with the Proto-Lungshan complex of North China. Whether the rarity of Lungshanoid sites south of the Yangtze delta reflects incomplete investigation of the area or the small density of its Lungshanoid population, cannot be determined at this time. After the rise of the local traditions of the Lungshan Horizon in North China, the southeastern Lungshanoid, derived from the Proto-Lungshan, apparently persisted in forms that were little altered; although here and there later Lungshan influences are observable in the local inventories, such as the *li* tripods in the Huaiho valley and the Liangchu assemblage of Hangchow which, in an upper stratum, contains some typical coastal Shantung Lungshan elements.

In the southeast as a whole, the Lungshanoid must now be considered a single ceramic horizon, which cannot be broken up into Proto-Lungshan and Lungshan Horizons, because in the area as a whole the Proto-Lungshan is widespread and the Lungshan only locally represented. At the Fengpit'ou site near the city of Kaohsiung in southwestern Taiwan, both the Proto-Lungshan and the Lungshan subhorizons of the Lungshanoid appear to be well represented, by the lower and upper layers, respectively. The Proto-Lungshan (described as Painted Pottery culture) and Lungshan (described as Black Pottery culture) features of the

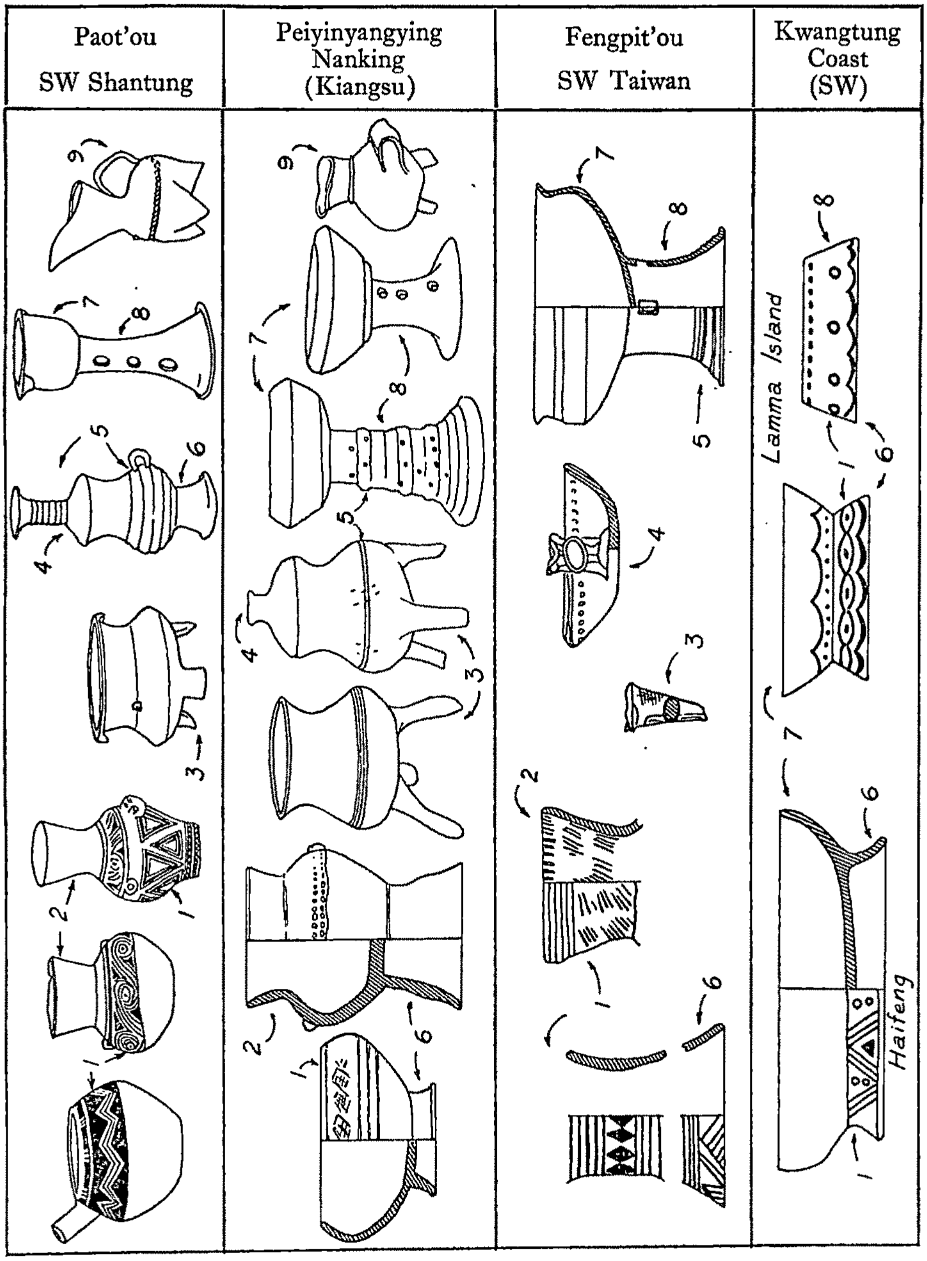

FIG. 1. Some Lungshanoid Horizon Markers, illustrated by finds from Paot'ou (Southwestern Shantung), Peiyinyangying (near Nanking, Kiangsu), Fengpit'ou (southwestern Formosa), and Kwangtung coasts.

1. ceramic painting; 2. *tsun* 尊 mouth; 3. tripod of the *ting* 鼎 type; 4. lid; 5. bamboo-like rings; 6. ring-foot; 7. *tou* 豆 fruit-stand; 8. pedestal with cut-outs; 9. tripod of the *kuei* 鬹 type.

Fengpit'ou strata are so conspicuously marked that Tsuboi (1956), investigator of the site, concludes without hesitation that 'the main current of [its] early civilization was fundamentally developed from the agricultural civilization that came there across the [Formosa] Strait from the opposite shore of the Chinese mainland'.

Besides Fengpi'tou, reports of painted pottery of the Proto-Lungshan variety on the island have come from two or three other localities in the vicinity of Kaohsiung and on the Pescadores (Kanaseki 1943) and, as mentioned above, red potsherds probably falling within the Proto-Lungshan categories have been uncovered from the lower stratum of Yüanshan. Black sherds that are described as 'Lungshan-like' have been found in a few sites in the Tainan basin as well as in the middle part of the island (Kanaseki and Kokubu 1949: 34). Although, only after extensive excavations have been made will the full extent of the Lungshanoid culture on Taiwan island be known, it is beyond question that the island comes within the sphere of expanse of this southeastern ceramic horizon.

GEOMETRIC HORIZON

At least in some local Lungshanoid phases, in the southeastern coastal regions, were some or even most of the pottery moulded by hand. The vessels were beaten on the outside with a paddle, with a block inside to serve as anvil. The paddle was often carved with geometric designs, such as checkers, cord-marks, and textile marks, and impressed on the pottery surface. About the time when the Shang civilization arose in the North, in the southeast occurred an upsurge of the geometric decoration of pottery which, together with a number of other concurrent changes in ceramic and other technological features, gave rise to the widespread Geometric Ceramic Horizon. Among the notable other concurrent changes was the growing popularity of urns, footless and neckless or with low ring feet and necks, hand-made, hard fired into a bluish gray colour, and impressed with a variety of the so-called geometric patterns: checkers, parallel lines, basket-marks, concentric circles, chevrons, wavy lines, and interlocking rectangles. Many Lungshanoid forms and decorations lingered on, though these diminished gradually.

The stone and ceramic inventory of the Geometric Horizon, together with its rice cultivation and the habitation patterns, apparently indicate that this ceramic horizon of the southeast was an outgrowth of the Lungshanoid of the same area. But there must have been arrivals of both new immigrants and new cultural elements from Bronze Age North China as shown by the following phenomena: *(i)* Geometric ceramics identical with the southeastern forms constituted an important part of the Shang pottery inventory; and many of their shapes and decorations suggest the influence of bronze vessels on the making of pottery. *(ii)* Evidence of bronze foundry has been brought to light from sites of the Geometric Horizon in Kiangsu and Chekiang. *(iii)* Whole assemblages of Shang ceramics and bronzes have been found as far south as the Huaiho valley, and whole assemblages of Western Chou ceramics and bronzes as far south as southern Chekiang and Anhwei, occurring there side by side with the local Geometric phases.

The general area of distribution for the Geometric Horizon in southeastern China is largely the same as the Lungshanoid, but the density of sites grew within this area to a remarkable extent. Whereas we have been able, as of now, to identify one or two Lungshanoid sites each for Chekiang, Fukien, and Kwangtung, these three coastal provinces have yielded literally hundreds of Geometric Horizon sites. This probably reflects a much greater population density involved with this horizon, which also spanned a longer period of time.

Most of the Taiwan prehistoric sites, which in overwhelming majority are located so far on the western coast, can be classified into the Geometric Horizon. Scores of sites with geometric pottery have been excavated from the Tainan basin in the south of the island to the Taipei basin in the north. Unquestionably the colonization of Formosa by mainland farmers took place mainly during this period or, roughly, from 1500 to 200 B.C. On the mainland, the Geometric Horizon exhibited more and more Bronze Culture characteristics (such as remains of bronze foundries, bronze artifacts, and many bronze vessel patterns on pottery) toward the latter phases of the Chou dynasty. Since such characteristics are virtually absent in the archæological remains on Formosa, it is probable that after heavy waves of immigrants landed on the island from the Geometric regions on the southeastern coast of the mainland during the first part of the 1500–200 B.C. interval, not only did new immigrants cease to arrive in numbers, but also close contacts between the mainland and the island discontinued. After about 200 B.C. the Han civilization penetrated all the southeastern coastal provinces while Formosa alone remained unaffected (Ling Shun-sheng 1952). An early Geometric ceramic tradition persisted on this island throughout the last centuries B.C. and the entire A.D. era until the ethnographic present. This noteworthy and somewhat strange archæological phenomenon must at the present remain unexplained. It might be argued that the pioneer settlement of Formosa by the neolithic Geometric farmers may have been curbed gradually by political authorities as the Eastern Chou civilizations grew and expanded into the southeast, but we have no substantial evidence for this.

CONCLUSIONS

This summary of new archæological evidence from southeastern China serves to reaffirm the long-held view of archæologists that the bulk of prehistoric cultures on the island of Formosa arrived from across the Formosa Strait in successive waves. The new materials from a region hitherto relatively unknown archæologically may serve to remove any lingering doubts about the close cultural ties between Formosa and North China conjectured previously on typological comparisons only. The better-known archæological sequence in southeastern China are also helpful in a chronological alignment of the western coastal cultures of Formosa. We now know with considerable certainty that the first ceramic horizon of Taiwan was probably an eastern offshoot of the Corded Ware Horizon of the Chinese Southwest. The Lungshanoid Horizon, centering in Kiangsu, established a few outposts in Chekiang, Fukien, Kwangtung, and Taiwan, and the extensive colonialization of the island was accomplished during the first phases of the Geometric, around the end of the second millennium and the beginning of the first millennium B.C.

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6

Formosan Relationships with Southeast Asia

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INTRODUCTION

On Formosan archæology very little is available to the non-reader of Japanese and Chinese, and this is the first English paper, to my knowledge, on Formosan relations with Southeast Asia. I have not been able to consult in its entirety the Japanese paper on 'The place of Formosa in the Prehistory of Southeastern Asia', by Tadao Kano in his *Studies in the Ethnology and Prehistory of Southeast Asia* (Vol. 2, 1952: ch. 7, pp. 89–186). Dr Erika Kaneko has kindly furnished a translation of Kano's conclusions published below.

English language materials on Formosa are limited to three short primary sources and several short secondary sources including English summaries of Chinese articles. The major primary source is 'Fengpit'ou: A prehistoric site in south Formosa that yielded painted and black pottery' by Kiyotari Tsuboi (1956). Others are: Solheim (1961*a*) on a jar burial site, and Leach (1938) on stone tools from Botel Tobago. Secondary sources of value are: Chang's survey of Formosan Archæology (1956), three papers presented at the Eighth Pacific Science Congress in Manila (Kokubu 1956; Mabuchi 1956; Miyamoto 1956) and Beyer's introduction to these papers (1956); very brief summaries in Beyer's two major works on the Philippines (1947, 1948); Kaneko's article on stone implements (1953), and English summaries of three primary sources in Chinese (Sung 1954–1955; Sung and Chang 1954; Shih and Sung 1956). The several articles in English, or in Chinese with English summaries, which appeared in Taiwan journals, on the distribution of specific artifact types or cultural complexes on Formosa and elsewhere have not been used.

Supplementary data has been gathered from the illustrations of three reports in Chinese (Records Office of Nan-t'ou District, 1956; Liu Chih-wan 1960; Liu Pin-hsiung and Liu Chih-wan 1957) and from Kano's two volumes on Southeast Asia (1946, 1952).

This report is suggestive and tentative. Annotated and abridged translations of several of Kano's comparative studies on Formosa and Southeast Asia (which we hope to publish in *AP*) will present a more comprehensive picture.

PALÆOLITHIC

No definite palæoliths have been reported in English from Formosa. Beyer (1947: 209), however, mentions ' . . . possible palæoliths found with Pleistocene mammalian fossils; of rhinoceros, stegodon, etc. (see notes by I. Hayasaka 1942)'.

Since it is logical that palæolithic man was on Formosa, I suggest here for comparison, the following.

Von Koenigswald (1956: 357) has noted that 'The fossil fauna of Formosa (Hayasaka) contains virtually the same elements as that of the Philippines', and that Formosa and Luzon were probably connected by a land bridge during a portion of the Pleistocene. In 1958 he reported the finds of fossil rhinoceros, stegodon, and elephant from the surface of the Cabalwan anticline in northern Luzon and from the same surface a few hand-axes and choppers as well (Solheim 1958: 62). My suggestion is that the makers of these tools (Koenigswald 1960) may have reached the Philippines from South China via Formosa, while following the large mammals reported from both Luzon and Formosa and that similar remains will in due time be found on Formosa.

NEOLITHIC

Heine-Geldern's (1932) major subdivisions of the Southeast Asian Neolithic are useful in comparing Formosa to Southeast Asia; they are named after the typical cross-section of adzes considered the type adze of respective major migrations. These are the Walzenbeil, Schulterbeil, and Vierkantbeil.

Walzenbeil (Early Neolithic)

The Walzenbeil adze is circular to oval to lenticular in cross-section and presumably moved from the north, possibly by sea, from Japan and possibly along the China coast from northeastern China. A number of culture traits were supposedly associated with the adze, including ring-built pottery.

Beyer subdivides the Walzenbeil adze types into three subtypes and presents the distribution for these (1948: 20–28). His Type I is oval in cross-section and this is found in Japan, Formosa, Luzon and from central China southward through Vietnam, Laos, Cambodia and into Malaya, but is less common in the south of northern Vietnam. While this north south spread is possible, it remains also possible—were it not that we still lack dated sites—that the adzes evolved out of Hoabinhian and Bacsonian adzes, which were much the same shape though more crudely made. Many adzes of this variety are illustrated in the *Collection of Essays on Nan-t'ou* (Records Office of Nant'ou district, 1956) and the reports by Liu Chih-wan (1960), Liu Pin-hsiung and Liu Chih-wan (1957), Sung and Chang (1954) and others. These adzes vary from oval to rectangular and from oval to lenticular in cross-section and their form may well have been influenced by these other two forms when they entered Formosa. Ring-built pottery has not been found in the greater part of this area, though present in North China, Japan, and very rarely in Formosa and the Philippines.

Beyer's Type II is the cylindrical adze with circular cross-section. It is absent on the central and southern mainland, rare in the Philippines (Beyer 1948: 25) and not mentioned for Formosa. I have been unable to find any reference or illustration to it in the literature I have on Formosa.

Beyer's Type III is the sharp-sided or lenticular adze. It ' . . . appears to be wholly absent on the Southeast Asiatic mainland . . . [and] sparsely known from the Philippines and Formosa . . . [it] extends eastward across Siberia to Manchuria and from there directly southward through Japan to the Bonin Islands, the Marianas, the Palaus, and on through western Melanesia to a termination in east Java' (1948: 26). In several of these areas where pottery is manufactured, ring building is still used. In Luzon among some of the Ifugao, the potters are men and they use ring building (Solheim and Schuler, n.d.). The same situation is found among the Yami on Botel Tobago (Sung 1957). Pottery manufacture by men and ring building are very rare in Southeast Asia and adjacent islands. However, a statistical analysis of pottery manufacture (Solheim, still in process) shows that while these two traits are not always present, a high percentage of the pottery traits associated with ring building exists in the primary area of distribution of the lenticular adze.

As far as Formosa and Southeast Asia are concerned, the two types of Walzenbeil adze (oval and lenticular) appear to be of distinct origin—though possibly ultimately from the same source in northeast China and Manchuria—and spread. The oval adze probably evolved out of the Hoabinhian-Bacsonian tradition in northern Vietnam and spread from there south, east into the Philippines and Formosa, and possibly north into Japan and South China. Early cord-marked pottery may have spread with this into some areas. This type of pottery is found in Formosa associated with the oval adze (see publications already cited above on the oval adze in Formosa). Pottery has not been found in early neolithic sites in the Philippines and its association with the oval adze at other sites in Southeast Asia is uncertain. The lenticular adze and ring-built pottery are associated and found sparsely in Formosa and the Philippines, though not on the Southeast Asian mainland or western Indonesia. This combination is also found in eastern Indonesia and south over much of Melanesia.

Schulterbeil (Middle Neolithic)

The Schulterbeil or shouldered axe/adze, is found in Further India, South China, northern Celebes, the Philippines, Formosa, Japan, and Korea. Beyer and Heine-Geldern consider it as being Middle Neolithic (Beyer 1948: 28–30; Heekeren 1957: 129). It is likely that two distinct periods for the tools have been classified as Schulterbeil (or as Schulterbeil and the combination of Schulterbeil and Vierkantbeil). The earlier period is primarily Middle Neolithic, but the tools of the probable later period were made in imitation of bronze shouldered adzes. While on the mainland and in the Philippines and Celebes the early shouldered and ridged adzes are Middle Neolithic, in Formosa they are commonly found, if not always, in sites associated with stepped adzes, ordinarily considered as Late Neolithic. An artifact found associated with the Schulterbeil in the Yüanshan shell-mound and related sites in Formosa, which is also linked with the Philippines and Celebes, is a polished triangular arrow or dart head (Beyer 1948: 30; Chang 1956: 379; Callenfels 1951: pls VII and XI). A possible variety of the shouldered adze is a violin-shaped tool found in Celebes, Formosa, and Japan, but not yet found in the Philippines (Heekeren 1957: pl. 47; Beyer 1948: 30; Callenfels 1951: pl. VIII). This tool was probably used as a hoe, like many other varieties of the shouldered adze, and in this use lasted until only a few hundred years ago (Kaneko 1953). A third tool is an oblique-edged adze found in Japan, Formosa, the Philippines, and Celebes (Chang 1956: fig. 2, no. 3; Callenfels 1951: pl. VII; Beyer 1951: 94–95).

In Yüanshan related sites in Formosa, possibly associated with the Schulterbeil is a coarse pottery, at times with a red slip, round-bottomed or with a ring foot, with impressed mat or ring design and parallel dots (Chang 1956: 379). Pottery does not appear to be associated with the shouldered adze in the Philippines, and its association in the Celebes is uncertain. Pottery with a generally similar description is found in the 'Hoifung SAK' horizon and to a lesser extent the following 'Hoifung PAT' horizon of South China. Both these cultures made polished triangular arrowheads, but the SAK horizon had less developed adzes than the Schulterbeil adze type, and the PAT horizon had stepped adzes and possibly a few that are intermediate between shouldered and stepped (Maglioni 1952: 3–8).

The term 'Schulterbeil' is reasonably used to designate a tool type. The early variety of this tool type can be equated with a general Middle Neolithic, but is not a good term to serve as title for a specific culture. The tool is found over a wide area, often associated with similar artifacts; but the associated tools are not sufficiently consistent over the total area that all sites with the shouldered adze may be taken to belong to one culture. Their continued use up until a very recent time as a hoe is another reason for using it only as a type of artifact first associated with a supposed middle neolithic culture.

Vierkantbeil (Late Neolithic)

The Late Neolithic of Formosa could no doubt be subdivided into several phases as Beyer has done for the Philippines. But with the information on hand these phases cannot be distinguished and so comparisons are made on a general late neolithic level rather than by subdivisions.

The Yüanshan shell-mound, on the basis of its stone tools, in comparison to late neolithic tools from the Philippines, appears to cover the entirety of the Late Neolithic and back into the Middle and possibly even Early Neolithic. The primary reports, which I have, of the Yüanshan shell-mound cover only the stone tools found previous to 1950 and give no information on stratigraphy. It might well be that even the oval and lenticular and also the waisted (Sung 1954: pls IX–XII), and shouldered adze (Sung 1955–no. 5: pl. VIII) were contemporary with the Vierkantbeil forms found there. The quadrangular adze forms illustrated by Sung include rectangular to trapezoidal plain backed adzes (1955–No. 5: pl. V), through the ridged and early stepped forms (1955–no. 5: pls. VI–VII) to virtually the fully stepped form (1955–no. 5: pl. VII 8) along with stone boring (1955–no. 6: pl. I, VI) and possibly stone sawing (1955–no. 6: pl. VI 13). According to Chang (1956: 379) jade implements are also found here. This covers all of Beyer's subdivisions of late neolithic culture in the Philippines (Beyer 1948: 39–40). Many of these forms are found at other sites on Formosa and are found in varying numbers at sites in the South China coastal area to Formosa to Luzon (Beyer 1948: 51–54). The early form of the stepped adze is also found in Celebes (Heekeren 1957: 129 and fig. 24*b*). The stepped adze and forms transitional to it have not been found elsewhere in Southeast Asia. The small islands off the east coast of Formosa, Samasama and

Botel Tobago, do not have the stepped or transitional forms but do have other late neolithic stone-tool forms (Beyer 1947: 210).

The stone points associated with Yüanshan materials are triangular (Chang 1956: 379). These are not the typical late neolithic type but more middle neolithic, though they possibly lasted well into the Late Neolithic. The triangular polished points are also found at Fengpit'ou in a context that includes both shouldered and plain backed rectangular or trapezoidal adzes (Tsuboi 1956: 283, figs D18, 19). Stratigraphically above these forms are the more typical late neolithic polished points with stems or tangs (Tsuboi 1956: 288, figs G47–52). Polished, stemmed points are found in Batangas province in the Philippines, with similar forms from China, Indochina and the Hong Kong—Hoifung area of South China (Beyer 1948: 62–63, figs 22–23).

Pottery is definitely found in the Late Neolithic in Formosa, associated with the stone tools. Pottery from Yüanshan possibly associated with shouldered adzes is more likely Late Neolithic than Middle Neolithic. From Chang's description (1956: 379) it appears much like the pottery found elsewhere in Formosa associated with the latest neolithic artifacts and in some sites associated with iron, and in the Philippines so far found only in Iron Age sites (see below). The pottery from Fengpit'ou is more likely of neolithic origin. Associated with the shouldered adze, plain backed rectangular adze and the triangular point, is a painted and red pottery; its forms and some of its decoration are very similar to those found in two different pottery complexes in the Philippines. The decoration illustrated in figures A13–14 and 16–17 and figure B27 (Tsuboi 1956) is very similar to the typical decoration on pottery of the Novaliches pottery complex in the Philippines (Solheim, n.d.*a*), except for the *method* of decoration. The Philippine pottery is not painted but has an incised, impressed, or carved pattern. Also, the form of the vessels with this decoration (figs A13–14 and 16–17, fig. C41–42) is almost exactly the same as in the Novaliches pottery. The resemblances to the Kalanay pottery complex in the Philippines are less specific. Very rarely painted decoration is found—red or red and black on a tan background—but the patterns are not similar. The impressed decoration near the rims of the red pottery, illustrated by Tsuboi (figs D28–30, 37), appears very similar to a style of impressed decoration found on rims, angles, or flanges of the Kalanay complex pottery (Solheim, n.d.*a*; Solheim 1961: pl. VII). As to the similarity in form, the rim and body forms of the painted pottery (Tsuboi 1956: fig. A1–12) are all found in the Kalanay complex pottery, while those specific for the Novaliches complex are not present in the Kalanay complex pottery. However, many of the Kalanay complex forms are not illustrated from Fengpit'ou. The Novaliches pottery is of Iron Age association. The Kalanay pottery complex is commonly found associated with iron but has also been found in late neolithic sites (Solheim 1961*b*: 162–163).

Stratigraphically, above the painted and red pottery of Fengpit'ou was found a black and brown pottery, associated with the more typical late neolithic stone artifacts already mentioned. While this pottery is distinct from the earlier pottery it has several resemblances in form though virtually none in decoration. Some of the apparently new forms and of the continued forms are similar to forms of the Kalanay Complex pottery on the Philippines (Tsuboi 1956: fig. E–F; Solheim

1961*b*: fig. 2). Several of the new decorative elements are also found on Kalanay complex pottery, and in particular triangular or varieties of chevron designs (Tsuboi 1956: figs E9, 11, F22, 23, 25, 26, 34–36, 40; Solheim 1691*b*; fig. 1, 5th, 6th, and 8th row). While several elements in both form and design are shared between the red painted pottery, the black and brown pottery, and pottery of the Kalanay pottery complex, their differences are more obvious than their similarities. These pottery groups do not give the feeling of being closely related.

Bronze Age

There probably was no distinct Bronze Age in Formosa but a small number of artifacts, some of these being heirlooms, are known and equated with the so-called Dongson bronze culture. Kano illustrates several of them, ordinarily a dagger handle of bronze, in the form of a total human body with the emphasis on the head, often with some form of headdress or turban (1946: pls 16, 19; 1952: pl. 22). Generally similar figures of bronze, also forming handles, are illustrated by Kano from Dongson (1946: 205, pl. 17) and from Malaya or Indonesia (1946: 208). Standing figures now made in brass, but probably formerly in bronze, are found on the end of walking sticks in the Mountain Province of Luzon. A number of dancing figures in bronze, probably used as pendants rather than as handles, were found in Sumatra (Heekeren 1958: 36–37, pl. 9). There is considerable variation in these figures but they all share the representation of a human figure in bronze often functioning as a handle. There is no indication of a 'Dongson culture' spreading over a wide area but rather indications of some elements from a possible Dongson culture, as found at Dongson, diffusing in a scattered pattern over a wide area.

Iron Age

Iron artifacts are as rare as those of bronze, at least in the reports. The one illustrated iron artifact that I have come across is from Fantzuyüan shell-mound in T'aichung prefecture near the west coast of Formosa. Several stone tools were found in the same layer as the iron knife-blade but they have a generally curved sharp edge and a blunt straight back that is not similar to the neolithic tools discussed before (Shih and Sung 1956: 49, pls IV, VII). Two prone burials were found associated with the same cultural layer, but without any mortuary objects. Potsherds were abundant; the rim and body sherds indicated a common form with slightly everted rim and rounded or slightly flattened bottom. The gray and black wares are primarily plain with 6·04% decorated with incised parallel straight and wavy lines and patterns made up with dots, all made using a comb-like instrument. Brown wares differ only slightly from this but have less decoration (Shih and Sung 1956: 87–88, pl. V). A few sherds of the gray and black ware show that a carved paddle with parallel ribs was used, and that simple and pressed designs were done with a simple tool (pl. VI, 1–5, 7–9). Sherds of a grayish-brown ware are distinct in paste and decoration; exteriors are all covered with carved paddle decoration (88, pl. VI, 10–24) like the 'Bao-Malay' pottery of Southeast Asia (Solheim 1959: 2–3).

The general decoration of the two distinct pottery groups at Fantzuyüan shell-mound fits the pottery as described by Chang (1956: 379–380) for his *(b)* Yüanshan culture, *(c)* brown impressed checker-design pottery culture, *(d)* black and gray pottery culture, and *(f)* gray and brown impressed checker-design pottery culture. These two general types of decoration: the comb-incised and impressed, and the carved paddle impressed, probably entered Formosa in the Late Neolithic—the latter decoration, at least, lasted to the present day.

Both these general kinds of pottery decoration are found in the Philippines and elsewhere in Southeast Asia. The comb-incised and impressed decoration appears to be less widely distributed in Indonesia and Southeast Asia but extends into Melanesia. In the Philippines the earliest carved-paddle impressed pottery appears in Palawan by A.D. 200 or 300 (Solheim, n.d.*b*). This pottery (Solheim, n.d.*b:* pl. I–III) is very similar in appearance to that of Fantzuyüan (Shih and Sung 1956: pl. VI 10–24) and Mat'oulu (Sung and Chang 1954: pl. II 13–21). The comb-incised wavy lines and related patterns are considerably later in the Philippines, and are found at sites in Santubong, Sarawak, and Oc-Èo, Vietnam, probably sometime between A.D. 500 and 1,000; in all cases they are several hundred years after iron has come in. In Formosa both decorations are found together and appear to be of the same age, from late neolithic times on. According to Chang (1956: 379–380), Mat'oulu is one of the type sites of the early black and gray pottery culture and has both kinds of decoration. Mat'oulu contains no iron and has all the appearance of being a late neolithic site (Sung and Chang 1954). Fantzuyüan, with both kinds of decoration from the same layer, includes an iron knife.

URN BURIALS

Large earthern burial jars have been excavated only on the eastern side of Formosa and on the islands of Samasama and Botel Tobago (Solheim 1961*a:* 137). Most of the excavated jars had no associated artifacts; some on Samasama contained white and green or light blue glass beads (Solheim 1961*a:* 139). Glass beads are usually associated with iron and are not considered to be pre-iron, though they may have been traded into a neolithic community before iron. Burial jars are used to the present day. The Kuvalan tribe in northeastern Formosa still practise it (Solheim 1961*a:* 139). It is also still found in Taipei. When I visited the Yüanshan shell-mound in 1960 under the guidance of Liu Chih-wan and Liu Pin-hsiung our way led through a circular area with a cylindrical brick structure in the centre. Crowded around outside this structure and inside as well were many earthernware jars containing secondary burials, some of them quite fresh. These were on the surface rather than buried.

Earthernware burial jars have been found from Japan, through the Babuyan and Batanes islands in the Philippines into Indonesia (Solheim 1961*a:* 143–144) and Annam (Solheim 1961*c*). Many are generally similar, but the associated artifacts vary greatly. Their spread in these areas does not appear to be due to the migration of a 'jar burial culture' (Solheim 1961*a:* 144–145).

MEGALITHS

Kano states that the megalithic complex includes bronze and iron. He says that 'It is to date limited to the east coast and southern Formosa. The characteristic inventory consists of menhirs, stonewalls, stone-cysts (from cut slabs), mortars, stone pestles, mealing stones, etc.' (Kano 1952: 180). With these we may include the stone platforms still found among the Paiwan (Ling 1959: pl. 1).

Such megaliths are scattered in many areas of Southeast Asia: the Philippines, northern Laos, Malaya, Sumatra, Nias, Java, Borneo, and Celebes. These stone platforms with associated menhirs, like that pictured for the Paiwan, are found among the Bontok and in the Mountain Province of the Philippines, and out into Polynesia.

CONCLUSIONS

Very little can be said for the present on specific relationships between Formosa and Southeast Asia. Nearly all the artifact types found in Formosa can be matched with similar types in Southeast Asia, particularly in the Philippines and to a lesser degree in Celebes and northern Indochina. No complex of artifacts from a specific site in Formosa can be closely connected with a corresponding complex from a specific site in Southeast Asia. Further intensive archæology in these areas may eventually discover closely comparable sites.

The majority of the prehistoric relationships between Formosa and Southeast Asia do not appear to me to be direct, but the result of small movements from a common general source in South China and northern Indochina and possibly, even more important, diffusion of specific culture elements in all directions from late neolithic times on. A direct connection in the Early Neolithic by some movement from the north along the east coast of Formosa and the Philippines into eastern Indonesia remains possible.

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7

The position of the Malayopolynesian Languages of Formosa

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It is of some interest to know how many different families of Malayopolynesian languages are to be found in Formosa and to determine their relationship with other Malayopolynesian families.[1] Although the material now available does not permit a final decision, there appears to be some indication of a trend.

My article 'The Lexicostatistical Classification of the Malayopolynesian Languages' (Dyen 1962) shows that, a number of the Malayopolynesian Languages of

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Am$_1$	— Ami LL, E. P. Torgesen.
Am$_2$	— Ami LL, Chen-Li.
Am$_a$	— Ami, all dialects, OA.
AmB	— Ami, Baran dialect, OA.
AmK	— Ami, Kibi dialect, OA.
AmTa	— Ami, Taparon dialect, OA.
AmTo	— Ami, Tooran dialect, OA.
At$_1$	— Atayal LL, Clare McGill.
At$_2$	— Atayal LL, CL.
AtTh	— Atayal (Taihyoo dialect), OA.
AtTk	— Atayal (Takonan dialect), OA.
Bu$_1$	— Bunun LL, Fu Wen-Chih.
Bu$_2$	— Bunun LL, CL.
BuN	— Bunun, northern dialect, OA.
BuC	— Bunun, central dialect, OA.
BuS	— Bunun, southern dialect, OA.
CL	— set of lexicostatistical lists submitted by Chen Chi-lu on the basis of material of F. K. Li.
Ilk	— Ilocano.
K	— Kanabu or Kankanabu language, OA.
Kv	— Kavalan LL, CL.
LL	— lexicostatistical list.
Ml	— Malay.
OA	— N. Ogawa and E. Asai (1935).
Pa$_1$	— Paiwan LL, John Whitehorn.
Pa$_a$	— Paiwan, all dialects, OA.
PaDm	— Paiwan, Daima dialect, OA.
PaDt	— Paiwan, Daityooman dialect, OA.
PaKp	— Paiwan, Kapiayn dialect, OA.
PaKt	— Paiwan, Katirai dialect, OA.
PaKu	— Paiwan, Kunanau dialect, OA.
PaLi	— Paiwan, Likiliki dialect, OA.
PaLP	— Paiwan, Lower Paiwan dialect, OA.
PaN	— Paiwan, Nai dialect, OA.
PaNb	— Paiwan, Naibun dialect, OA.
PaT	— Paiwan, Tokubun dialect, OA.
Pu$_2$	— Puyuma LL, CL.
Pu$_a$	— Puyuma, both dialects, OA.
PuT	— Puyuma, Tippon dialect, OA.
PuP	— Puyuma, Pinan dialect, OA.
Pz	— Pazeh LL, CL.
R$_2$	— Rukai LL, CL.
R$_a$	— Rukai, all dialects, OA.
RMg	— Rukai, Maga dialect, OA.
RMn	— Rukai, Mantauran dialect, OA.
RTn	— Rukai, Tainan dialect, OA.
RTo	— Rukai, Tona dialect, OA.
RTr	— Rukai, Taramakau dialect, OA.
Se$_1$	— Seedik LL (Taroko dialect), Ralph Covell.
Se$_2$	— Seedik LL, CL.
SeK	— Seedik, Kiri dialect, OA.
SeT	— Seedik, Taroko dialect, OA.
Sr	— Saaroa, OA.
Ss	— Saisiyat, OA.
T$_a$	— Tsou, both dialects, OA.
TA	— Tsou, Arizan dialect, OA.
Tg	— Tagalog.
Th	— Thao LL, CL.
TR	— Tsou, Rufuto dialect, OA.
TT	— Tsou as reported in T. H. Tung,(n.d.)

Words are often cited in a different form from that of the source; the substitutions, where not one-for-one, are in accordance with my phonemic interpretation of OA.

Formosa have a critical percentage of less than 25%; they are: Thao (24·5%), Bunun (24·5%), Paiwan (24·5%), Ami (24·5%), and the Atayalic Subfamily ([there called Group] 13·6%). In the case of an individual language, the critical percentage used here is the highest percentage with any language; for a group, it is the highest percentage of any member with a non-member language. The Atayalic subfamily has as its members Atayal and Seedik whose lists exhibited 35·2% cognation.

To these languages can now probably be added Tsou. The highest percentage of Tsou with a Formosan language is 16·7% which it holds with Bunun and with Paiwan.

The lexicostatistical evidence given in my article (Dyen 1962: 38–46) indicates a great preponderance of highly diverse languages in the Melanesia-New Guinea area and thus implies that this area is the Malayopolynesian (or Austronesian) homeland; that from this area seven have a critical percentage 15·0% or lower and only one elsewhere; and furthermore from this area twenty-five (and seven from West Irian) have a critical percentage of 20·0% or less and only two elsewhere than in this area or West Irian.

Now the lowest critical percentage of any language listed in the article is 11·1% for Hapa of Morobe, NE New Guinea. Thus the percentages for the Atayal family and for Tsou are interesting because they suggest the possibility that Formosa rather than Melanesia-New Guinea may be the locus of the most diverse Malayopolynesian languages. This view could be defended on the grounds that the lexicostatistical percentages below 20·0% (and perhaps even those below some larger figure) are not sufficiently different to be taken at face value. It is not at all inconceivable that all of the Melanesia-New Guinea percentages are lower than they should be, if their proper relation were indicated. In that case the area of the Formosan languages might be proposed as a possible homeland because of the low scores of the Atayalic Subfamily and Tsou.

The argument presented here is that an examination of the vocabularies of the Formosan languages as they appear in the available material does not seem to confirm this hypothesis. Rather the indications from the vocabularies are, thus far, that the Formosan languages more probably constitute a single family.

Ogawa and Asai (OA) (1935: 3f) list the following languages of Formosa:

1. Atayal
2. Seedik
3. Saisiyat
4. Bunun
5. Tsou
6. Kanabu (=Kankanabu)
7. Saaroa (=Sisyaban)
8. Rukai
9. Paiwan
10. Puyuma
11. Ami
12. Kavalan
13. Pazeh
14. Thao (=Sao)
15. Ketagalan
16. Taokas
17. Papora
18. Babuza (=Favorlang)
19. Hoanya
20. Siraya

Of these numbers 15–20 belong to dead or nearly dead languages. In 1935 they were not spoken as native languages or were only remembered by old people.

Of the remainder the first eleven are reported on comparatively fully by OA. They also report on Yami, the language of Botel Tobago, but this is evidently closely related to Ivatan, the language of the Batan Islands. The latter seems clearly to be a member of the Philippine group of languages. For this reason we shall not discuss the Yami language.

TABLE 1

At$_1$	59·0													
At$_2$	60·0	82·9												
Se$_1$	32·7	37·7	32·7											
TT	07·4	09·0	07·8	10·9										
Th	06·6	08·3	07·4	13·5	16·3									
Bu$_1$	07·8	07·6	06·8	12·2	15·2	28·8								
Bu$_2$	08·3	08·3	08·0	11·7	16·7	29·2	65·7							
Pz	10·3	08·9	08·6	14·6	14·3	23·0	20·0	16·1						
Am$_1$	09·7	08·9	08·7	12·9	15·7	25·9	25·4	27·0	19·9					
Am$_2$	08·7	08·9	08·4	13·2	14·6	25·5	24·0	23·5	20·7	75·1				
Kv	06·2	06·9	06·1	10·0	13·9	19·0	18·9	19·0	18·5	24·7	24·1			
Pu$_2$	08·7	07·5	07·8	12·9	14·7	22·5	21·2	21·2	22·0	29·8	28·3	19·9		
R$_2$	07·9	06·8	06·0	09·9	13·1	16·7	17·4	15·4	14·8	20·0	20·1	15·4	25·6	
Pa$_1$	09·4	09·3	08·0	15·8	16·7	24·4	23·7	24·5	23·5	27·3	27·4	20·3	28·7	23·8
	Se$_2$	At$_1$	At$_2$	Se$_1$	TT	Th	Bu$_1$	Bu$_2$	Pz	Am$_1$	Am$_2$	Kv	Pu$_2$	R$_2$

Finally OA say of Kanabu (6) and Saaroa (7) that they should be regarded as dialects of Tsou (Ogawa and Asai 1935: 3f). They say the same of the relation between Seedik and Atayal *(idem)*, but it appears more likely that their relation is that of closely related languages than of dialects of the same language. Perhaps the relation indicated between Tsou and the other languages is likewise that between relatively closely related languages.

Swadesh lists of the following Formosan languages are available to me: Atayal (At$_1$, At$_2$), Seedik (Se$_1$, Se$_2$), Bunun (Bu$_1$, Bu$_2$), Rukai (R$_2$), Paiwan (Pa$_1$), Puyuma (Pu$_2$), Ami (Am$_1$, Am$_2$), Kavalan (K), Pazeh (Pz), and Thao (Th). The results of a new lexicostatistical comparison (by hand) is given in Table 1.[2] These results suggest that at the highest level there are three language groups in this comparison: F$_1$ containing Atayal and Seekik, F$_2$ containing Tsou, and F$_3$ containing the remaining languages.

The two lists of Seedik score significantly differently from each other. Se$_2$ is very much like an Atayal language; it scores 59·0% with one and 60·0% with the other Atayal list. On the other hand Se$_1$ scores 37·7% and 32·7% respectively with the same lists and 32·7% with Se$_2$. Furthermore Se$_1$, as might be expected from the fact that it is from the Taroko dialect, most commonly agrees with the Seedik of Taroko village (SeT) as recorded in OA. On the other hand Se$_2$ quite frequently agrees in form with the Atayal of Takonan as recorded in OA. I infer that Se$_2$ has been misnamed.

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[2] The lists available to me at the time of the machine calculation represented in my article in Language 38 are: At$_1$, Se$_1$, Th, Bu$_1$, Am$_1$, Pa$_1$. The following table presents the old percentages as calculated by machine and the new ones obtained by hand:

Group F$_3$ is determined by the following percentages:

Th — Bu$_2$	29·2	Pu$_2$ — Pa$_1$	28·7
Bu$_2$ — Am$_1$	27·0	Pu$_2$ — R$_2$	25·6
Am$_1$ — Kv	24·7	Pu$_2$ — Pz	23·5
Am$_1$ — Pa$_1$	29·8		

On the principle of subgroup homogeneity Atayal would be expected to show approximately the same percentages as Seedik (=Se$_1$). However, with members of F$_3$, Se$_1$ averages 5·1 percentage points (pp) higher than At$_2$ and 4·5 pp higher than At$_1$. Table 2 presents the differences between the percentages of Se$_1$ and At$_2$ with a given language (L$_i$) and the differences between the percentages of Se$_1$ and At$_1$ with the same language:

TABLE 2

	(Se$_1$-L$_i$)—(At$_2$-L$_i$)	(Se$_1$-L$_i$)—(At$_1$-L$_i$)
Th	6·1	5·2
Bu$_1$	5·4	4·6
Bu$_2$	3·7	3·4
Pz	6·0	5·7
Am$_1$	4·2	4·0
Am$_2$	4·8	4·3
Kv	3·9	3·1
Pu	5·1	5·4
R	3·9	3·1
Pa	7·8	6·5
	51·0	45·3
Average	5·1	4·5

This creates a suspicion that perhaps Atayal exhibits distorted percentages.

Qualitative evidence for the existence of a Proto-Formosan can take the form of likely common Formosan innovations: that is, sets of likely cognates which are found in the putative Formosan branches and have no extra-Formosan cognates among Malayopolynesian languages. The following sets of cognates satisfy these requirements; they exhibit at least one member from F$_1$ and one from F$_3$:

	Old	*New*		*Old*	*New*
At$_1$ — Se$_1$	35·2	37·7	Se$_1$ — Pa$_1$	13·6	15·8
At$_1$ — Th	08·1	08·3	Th — Bu$_1$	24·5	28·8
At$_1$ — Bu$_1$	08·5	07·6	Th — Am$_1$	19·8	25·9
At$_1$ — Am$_1$	10·4	08·9	Th — Pa$_1$	20·9	24·4
At$_1$ — Pa$_1$	10·1	09·3	Bu$_1$ — Am$_1$	23·0	25·4
Se$_1$ — Th	12·5	13·5	Bu$_1$ — Pa$_1$	20·3	23·7
Se$_1$ — Bu$_1$	11·5	12·2	Am$_1$ — Pa$_1$	24·5	27·3
Se$_1$ — Am$_1$	12·5	12·9			

The difference generally favours the later hand determination: this suggests that, if a difference in attention is not reflected, the linguist has perhaps gained some experience. Nevertheless it should be noted that the new figures only tend to emphasize a trend observable in the machine figures.

1.1. At$_2$ paliˀ, AtTh pali, Bu$_2$ paniˀ, BuC, BuS pane ‘feather’.

1.2. AtTk rahoˀ, TRn, RTr, R$_2$ maḍau ‘big’.

1.3. At$_2$ ramu, AtTh ramo, AtTk ramu-juX, Pa$_1$ jamoq, PaT ḍamoˀ, PaP damok, Pu$_2$ ˀada·moq, Pz ʔdamoʔ ‘blood’.

1.4. At$_1$ yuluŋ, At$_2$ juluŋ, AtTh, AtTk juluŋ, Se$_1$ roloŋ, SeT ruluŋ, RMg kroroŋo, Sr ḷoḷoŋa ‘cloud’.

1.5. Se$_1$ bĕlĕbil, Pa$_1$ venilevil, R$_2$ bilbil ‘pull’.

1.6. At$_1$ mĕqwas, pĕqwas, At$_2$ məquas, AtTh məqowas, AtTk maˀowas, SeK uwes, SeT ujas, Se$_1$ oyas (mooyas), Th maqa-qú·jiš, Bu$_1$ ka-xúdas, BuS xođas ‘sing’.

1.7. At$_1$ hĕma-li, At$_2$ ḥəma-di, AtTh hama-li, AtTk hama-ˀoi, SeK he:ma, SeT xamma/hmma, Se$_1$ hĕma, Pa$_1$ sema, PaLP sma, PuP sīma, Am$_a$ sīma ‘tongue’.

1.8. At$_1$, At$_2$, AtTh, SeK, SeT, Se$_1$ kawas, Th ká·waš, Pz qawas ‘year’.

1.9. AtTh hera, AtTk so:-hesa, RTr ko-eja, RMn iđa, RTo haku-ṣiˀa, Am$_a$ ina-tsiɹa ‘yesterday’.

1.10. AtTh mipusal, AtTk maposan, SeT mappusal, RTr maposal, R$_2$ mausaḷ, Bu$_a$ mapuṣan, K mapusanu, Sr mapuwal̥u, Th mapušađ ‘twenty’.

1.11. AtTh juŋai, AtTK zuŋai, SeK loŋŋai, SeT loŋŋaĭ, PuT uŋai, AmTo oˀŋai ‘monkey’.

1.12. AtTh qaom, AtTk aɣom, SeT aḷom, PaT ˀa:m, PuT harum, PuP arum, Am$_a$ aɹum, BuC qalom, BuS xaḷom, Sr ˀarumu ‘ant eater’.

1.13. SeK, SeT, RTn, Pu$_a$ walo, BuN wanno, BuC, BuS vanno, K anu, Sr ˀaloˀo ‘bee’.

1.14. AtTk rotok, Ss ɣotok, PaT ḷotok, RTr ḷutuk^{u}, T$_a$ jutuka, ‘rabbit’.

1.15. AtTh ḅətakan, AtTK ƀatakan ‘big bamboo’, SeK butakkan ‘bamboo’, BuC, BuS ƀatakan ‘big bamboo’, TR puˀtsoknu, TA putsoknu ‘bamboo’.

1.16. AtTh hajuŋ, SeK haroŋ, SeT haḷoŋ, PaT talīŋ, RTn ḥaḷiŋ^{ɨ}, Am tsaḷiŋ, BuS saaŋ, TA seoŋʉ, K aḷʉŋʉ, Sr (h)aḷʉŋʉ ‘pine’.

1.17. AtTh, AtTK kai, SeK kairi, SeT ka:ḷi, PaT kai, K ka:ri, Sr kari ‘language’.

1.18. SeK blebl, SeT bulbul, Pa$_a$ vulvul, RTr bulbul, PuT vulvul, PuP bulbul, Bu$_a$ bun-bun, K ta-ƀunʉƀunʉ, Sr ta-ƀul̥uƀul̥u ‘banana’.

1.19. SeK wassaŭ, PaT asao, RTr vasau ‘leaf’.

1.20. SeK, SeT buŋa, PuP boŋa RTa, RTo voŋa ‘sweet-potato’.

1.21. Se$_1$ sĕpog (sĕmpog), Th šmu·pił, Bu$_2$ mašipul, Pa$_1$ semopo ‘count’.

1.22. SeK bakki, SeT bakke, AmB faki, AmTo vaki ‘grandfather’.

1.23. SeK iđas, SeT i:das, PaT ˀilas, PaLP qilas, PuT ḥelas, Pz ˀilas ‘moon’.

1.24. SeT daleḥ, Se$_1$ dalih, RMg me-dali, Sr ma-sa:l̥i ‘near’.

1.25. SeK ukka, BuC, BuS ʋkka, TR ukˀa, TA uk(a)ˀa, Sr ukaˀa ‘not exist’.

1.26. Se$_1$ hoda, Pa$_1$ sola, Th ˀúldaˀ, Am$_1$ sorla, Am$_2$ suh daˀ, Kv suɣonaˀ, Pu$_2$ ʔorlaʔ ‘snow’.

1.27. SeK broa, SeT bḷuwa, BuS bil̥va ‘thunder’.

1.28. SeK rebu, T$_a$ sifu, K iƀu, Sr i:bu ‘urine’.

1.29. At$_1$ royiq, At$_2$ rujɛq, AtTh raojeq, AtTK raoji, Se$_1$ daoriq, SeK doṛeq, SeT daŭḷeq, Pz ʔdaurik ‘eye’.

1.30. At$_1$, At$_2$ timu, AtTh tsimo, AtTK tumu-jux, Se$_1$ timo, SeK tsimo, SeT tsimo, RTn$_1$, RTr$_2$ timo, RMg timus, RTo timoso, RMn timo ‘salt’.

1.31. Se$_1$ balay, Th muʔbalaʔbá·laj ‘right (correct)’.

1.32. At$_1$ siyik, AtTh səjik, Th ríšiʔ ‘liver’.

1.33. At$_1$ giqas, AtTh geqas, Pz hijaš ‘new’.

1.34. At$_2$ məstəmaq, Pu$_2$ maṭəməʔ ‘rotten’.

1.35. AtTh utas, SeT uttas, PuP ʔtas ‘penis’.

1.36. At$_1$ ruma, Se$_1$ doma, Pa$_1$ dzoma ‘some’.

1.37. Se$_1$ sinaq (sĕminaq), Pa$_a$ semenaq ‘wash’, K ma-tsina ‘wash, wash body’, TA mamtsi:no, Sr ma:sinu ‘wash body’.

Among those listed here a notable number have the following basic meanings: 1.1 ‘feather’, 1.2 ‘big’, 1.3 ‘blood’, 1.4 ‘cloud’, 1.5 ‘pull’, 1.6 ‘sing’, 1.7 ‘tongue’, 1.8 ‘year’, 1.19 ‘leaf’, 1.21 ‘count’, 1.24 ‘near’, 1.29 ‘eye’, 1.30 ‘salt’, 1.31 ‘right (correct)’, 1.32 ‘liver’, 1.33 ‘new’, 1.34 ‘rotten’, 1.36 ‘some’, 1.37 ‘wash’. This is not to say that some of the other meanings are not just as valuable for this purpose, or that those listed here are necessarily all more valuable than the others; no matter how one regards the individual members of the whole collection, the fact that there is so large a number of probable cognates in meanings in which borrowings as a rule are infrequent makes it probable that we are dealing with a subcollection of cognates that connect the Atayalic family with other Formosan languages.

The implication is then that the percentages of not only Atayal, but also of Seedik are lower than they should be. We conclude that the closest relative of the Atayalic Subfamily is to be found among the other Formosan languages, perhaps in F$_3$, and this subfamily is not likely to prove to be equally related with F$_3$ and extra-Formosan Malayopolynesian subfamilies.

The highest percentage of Tsou is 16·7% with Bu$_2$ and with Paiwan. Tsou on superficial examination appears to be quite aberrant. Thus it would be interesting to know whether there are cognate sets limited to Formosan languages which include a Tsou member.

The following list which is restricted to Tsou, Kanabu and Saaroa, shows that the last two form a group, but the evidence is not lexicostatistical. Whether they form a group or not, the following comparisons suggest a connection between the three languages:

2.1. T$_a$ hiṭsu, Sr il̥itsʋ ‘spirit’.

2.2. TR tşonni, TA tsoni ‘one’, K tsani ‘one’.

2.3. TR humulu, TA humuju, K nimuruʔu ‘blood’.

2.4. TR povoʔu, TA povʔū, Sr puwakū ‘wing’.

2.5. TA tsūmū, Sr ta:somu ‘thorn’.

2.6. T$_a$ tsojowa, Sr sasarowana̭ 'earth'.
2.7. TR, TA majumʉ, Sr marumʉ 'bitter'.
2.8. T$_a$ sojumu, Sr masarumu 'cold'.
2.9. TR mutsu, TA emutsu, K ḷamutsu, Sr ḷamutsu 'hand'.
2.10. TR ŋuʔxoŭ, TA ŋuʔhoŭ, ŋhoŭ, K ŋkaŭ 'monkey'.

The following are cognate sets with a Tsou member and one from F$_3$ and which in addition are restricted to Formosan languages as far as is known:

3.1. T$_a$ tseopuŋu, K tsarapuŋu, Sr saropoŋṷ, PaT taḷopoŋ, RTr taḷopoŋ 'hat'.
3.2. T$_a$ fuŋuu, K naƀuŋṷ, Sr ƀoŋoʔo, AmB fuŋoh, BuN ḅoŋŋo 'head'.
3.3. T$_a$ t'uhu, RTo tūtūnū 'liver'.
3.4. TR tojotsū, TA teotsʉ, RTn da:tso, PuP ḍarato 'hair-louse'.
3.5. T$_a$ kutʔi, PaT kuti, PuP koti, BuC kutte 'vagina'.
3.6. T$_a$ pasʉŋi, K ma'asʉŋʉ, Sr maaʉŋʉ, PaT vɨnaʔsiŋ, RTn wa-basiŋ, PuT paheŋ, AmTa vaʔsiŋ, BuC qasḅiŋ 'sneeze'.
3.7. TR pasunaĭnu, TA pasnaĭnu, Pa$_a$ sɨmɨnai, RTr wa-sɨnai, Pu$_a$ sɨmɨnai 'sing'.
3.8. T$_a$ jeŋhova, Sr maraŋil̥u, AmB ḷaŋl̥au 'blue'.
3.9. TR ŋutsʉ, TA ŋʉtsʉ, K taŋʉtsa, Bu ŋuttuts 'nose'.
3.10. T$_a$ futsuju, PaDm vɨtsinun, PuT vutinon 'egg'.
3.11. TR timujo, TA timejo, K atimoə, Sr ʔatimuḷa, PuP timuḷa, Am atimuḷa 'flea'.
3.12. T$_a$ mimo, K mima, Sr mijama, SkK, SeT mimaḥ 'drink'.
3.13. TR tso:bixi, TA tsoʔvihi, BuC ḍaqvisan 'far'.
3.14. TA tse:i, Am$_a$ ni-teʔeh 'dream'.
3.15. TT talʉ, K tumat-im-ana, Sr tuma t-im-al̥a, Bu$_a$ tan'a, Th t-unm-áđaʔ, Pz t-um-ȧraʔ 'hear'.
3.16. TR sofu, TA sofʉ, PuT saḥov, RTn aob 'roof'.
3.17. TT hisi, K anisi, Sr al̥i, Pa$_a$ alis, RTn walisi, Pu$_a$ wali, AmB wal̥is 'tooth'.

To these are to be added 1.14 'rabbit', 1.15 'bamboo', 1.16 'pine', 1.25 'not exist', and 1.37 'wash' from earlier comparisons. There are thus 22 instances to be counted here.

In the preceding two sets of likely cognates the following standard basic meanings are represented: 1.37 'wash', 2.2 'one', 2.3 'blood', 2.4 'wing', 2.6 'earth', 2.8 'cold', 2.9 'hand', 3.2 'head', 3.3 'liver', 3.7 'sing', 3.9 'nose', 3.10 'egg', 3.12 'drink', 3.13 'far', 3.15 'hear', 3.17 'tooth'.

Let us call the cognate-sets with initial numbers 2 and 3 Tsou Formosa-limited cognate sets. It would be risky, to say the least, to ignore these comparisons as perhaps containing material which suggests that Tsou is more closely related with F$_3$ than with any extra-Formosan language or subfamily. Furthermore Tsou's lexicostatistical percentage is not so low that we are forced to believe that Tsou is to be set off against all the other Malayopolynesian languages.

Not only do the sets of likely cognates given above point to Tsou's membership in a Proto-Formosan, but this same relation is indicated by some non-Formosa-limited cognate sets. The collection is as follows:

4.1. T_a tsufuʔo, Sr tsibʊka 'belly' (from *bituka).
4.2. TR fuʔusū, TA fʉʔusʉ, K ƀʉkusʉ, Sr ƀʉkʉʉ, AmB fukɨs, Pz bekʊ̥s, Kv boqas, Ss bukis 'hair' (from *buhuk).
4.3. T_a huʔo, Sr ʔalʊkʊ 'nail', AmB kanoʔos 'claw'.
4.4. T_a, AtTh iso, SeK issʊ, BuC soo, Am$_1$ kiso 'thou'.

Comparisons 4.1 and 4.2 involve metatheses which are limited to the languages cited as far as I know. Compare Tg. bitu:ka, Toba-Batak butuka 'intestines' with 4.1 and Tg. buhok '(head) hair', Javanese wòq 'beard' with 4.2.

Comparison 4.3 is perhaps in some way connected with the widespread set of cognates which indicate both an initial and medial *k: *cf.* Tg. kuko, Ml. kuku 'nail' among others. If the matching phonemes of the Tsou and agreeing words do not differ because of the shared dissimilation, then they indicate the presence of different proto-phoneme instead of *k in one of the two positions (probably the intervocalic position) or that etymon is independent of that of the Tagalog and Malay words.

The words in comparison 4.4 are undoubtedly cognate with Tg. qiyo 'your, you (oblique)'. The use of this form as subject suggests a common innovation among the languages listed.

The Tsou vocabulary appears to point to the fact that its closest relative is probably to be found among the Formosan languages, say those of F$_3$. This would suggest that Tsou's percentages are lower than they should be. Taken together with the evidence that the closest relative of the Atayalic Subfamily is probably a Formosan language, our evidence now indicates a single Formosan subfamily of Malayopolynesian.

In the course of this investigation the number of comparisons which appeared seemed to agree in pointing toward a close relationship between the Formosan languages as a whole and languages of the Philippines—though no attempt has been made to examine the counter possibilities. It is conceivable that a more careful investigation will reveal just as numerous and cogent etymologies which point to an equivalently close relation with the languages south of the Philippines. However, it is interesting to note that at least this putative collection did not impress itself in the same measure as the connection with Philippine languages. The following are the comparisons referred to above:

5.1. Bu$_1$, Bu$_2$ ámin, Am$_1$ ʔmin, Ilk. qa:min 'all'.
5.2. Pz$_2$ łamik 'cold', Ilk. lamʔek 'cold'.
5.3. PuT đapal, PuP dapal, Sr l̥apal̥u, Kv z̯apan 'foot', Ilk. dapan 'sole'.
5.4. Th punuq, Pz punoq 'head', HlBs. pu:noq 'head'.
5.5. AtTh səmaqeis, AtTk sumʔis, SeK smaissi, SeT suma-isi, PaT tsɨmaʔis, RTr wa-tsaisi, AmB mitaʔais, BuC mataqqais, TR t'me'esi, K tumata-isi, Th šmaqis, Pz sasais, Kv təmaʔis, Tg. tahiq 'sew'.

5.6. RTn tsɨnɨk^{ɨ}, Tg. tinik ‘thorn’.

5.7. Am$_a$ kasui, Pz kahuj, Pu kaui, Tg. ka:hoy ‘tree’ (cited here only because of the metathesis. Words like Ml kayu ‘wood’ are almost universal).

5.8. AmB rimakat, Pa$_1$ jemacat^s HlBs. lumakat ‘walk’.

5.9. At$_1$ qemalup, qalup, AtTh qəmalup, Ss ‘malup, Pa$_1$ qemalop, PaT ‘umalup, RTr w-alupu, PuT ḥimalup, AmB miˀalup, AmK mi-ḥalup, BuC qonop, BuS xanop ‘hunt’, Manmanua manganop ‘hunt’ (with cognates in many other Philippines languages).

The cognates in the last set are only provisionally regarded as limited to the Philippines and Formosa. Any one of them may yet turn out to have cognates outside of these two areas. For example, if a person were not (as for some time I was not) aware of the connection with Ngadju-Dayak eñau ‘wash’, he would probably also cite here: SeK s-im-inau, RTr wa-sinau ‘wash (clothes)’, BuC ma-sinav, PuP mu-lisao [with metathesis] ‘wash (utensils)’, Ilk. ˀinnaw ‘wash (dishes)’. We should of course keep in mind that if—as is not unlikely, but is not taken up as an objective of research—the immediate relation of the Formosan languages as a group is with Hesperonesian (Dyen 1962: 44) and not with the Philippine languages, this relation would explain the limited distribution of the word for ‘wash’ and presumably some collection of others. Under this hypothesis the highly restricted distribution of the following set of cognates would be explained: SeK nu-noḥ, TR nunuˀu, TA nunˀu ‘breast’, Merina nunu ‘nipple’. The immediate relationship of the Formosan languages with the Hesperonesian languages would just as effectively reduce the probability of a Formosan homeland of the Malayopolynesian languages.

The vocabularies of a number of the Formosan languages, which were investigated, appear to contra-indicate that Formosa is the likely homeland of the Malayopolynesian languages. The argument is essentially that the closest relative of the most diverse languages in Formosa, according to lexicostatistical classification, appears nevertheless in each case to be another Formosan language or subfamily, when the vocabularies of the same languages in Formosa are examined for cognate sets within the same limited range.

Of course, cognate sets of the same limited range are not proof positive of subrelationship even when the number is reasonably large; for such cognate sets can be produced by losses in the surrounding areas and can be simulated by the effects of borrowing. It can however be stipulated that as the number of cognate sets of the same limited range increases, the point of proof positive is approached. The argument from cognate sets of the same limited range is dependent on the probability that the collection of cognate sets contains exclusively shared innovations. Furthermore it should be remembered that not all of the Formosan languages have been subjected to investigation here.

To resort to other phenomena to obtain an evaluation of a lexicostatistical implication may be considered by some to be tantamount to regarding the lexicostatistical evidence as invalid. This is of course not true. However, there are two considerations which prevent us from taking a proportion (or percentage) to have absolute value. These are *(a)* the fact that a proportion represents a distribution, and *(b)* that a proportion may in a particular case reflect the effect of other factors than are normally present.

Each proportion is the midpoint of a distribution of values and is the most likely value of the distribution. However, if one wishes to consider all of the possible values, which have one chance in twenty or better of being represented by the proportion, this can be done by taking all the values which lie within one and two-thirds[3] deviations of the proportion itself. One standard deviation for Se_1—Pa_1 15·8% based on 165 determinate instances (26 positive instances) is 2·8 pp;[4] one and two-thirds standard deviations are 4·16 pp. Thus there is one chance in twenty (or five chances in 100) that the proportion 15·8% represents a value as high as 20·4%. [There are of course fewer chances than one in twenty that the observed proportion represents some value greater than 20·4%.] Although the same statement could be made for values lying between 11·2% and 15·8% (i.e. within one and two-thirds standard deviations less than 15·8%), the qualitative evidence adduced here do indicate, we think, that these lower values now have a lower probability than otherwise would appear, whereas a value among the higher values has a greater probability of being the true value. What has been said here about Seedik's percentages can likewise be said *mutatis mutandis* about Tsou's percentages.

There is a further possibility that a particular proportion reflects factors other than the normal one of random morpheme decay. We have good reason to believe (Dyen 1963: 60–66) that there is an abnormal (i.e. not present in every case) factor or abnormal factors, among them not unlikely word-taboo, which produce deflated proportions: that is, percentages which are lower than their normal value. We have already cited evidence which indicates that Atayal's percentages are deflated. It is not at all impossible that Seedik's and Tsou's are likewise deflated. If Seedik's percentages are deflated, the implication is that Atayal's are even more deflated than has thus far been indicated.

That Seedik's and Atayal's percentages are possibly deflated does not affect the implication of the low percentages in the Melanesian-New Guinea area. The argument there depends on the large number of languages exhibiting low critical percentages. It is difficult to believe that all or even a significant proportion of these percentages are deflated.

It therefore seems fair to say that one method of checking the lexicostatistical comparison of the Formosan languages gives evidence to suggest that the surprisingly low critical percentages of Formosan languages should reasonably be expected to be corrected upwards to agree with the hypothesis of a homeland in the Melanesia-New Guinea area. Of course it is understood that we now expect that the same method as applied to languages in the Melanesia-New Guinea area will not suffice to produce evidence for a subfamily including all of the languages of that area.

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[3] R. A. Fisher and F. Yates (*Statistical Tables*, New York, 1957, p. 42) give 1·64 standard deviations instead of the 'one and two-thirds standard deviations' used here.

[4] From the formula $\sqrt{npq}$ for the standard deviation of the binomial distribution; this leads to $\sqrt{165 \cdot 15{\cdot}8 \cdot 84{\cdot}2} \div 165$ for one standard deviation for the proportion 15·8%.

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8

A Selected Bibliography of Taiwan Archæology: 1953–1962

Note: This list is an up-to-date supplement to 'Books and Articles Relating to the Archæology of Taiwan', compiled by Sung Wen-hsün, in the *Bulletin of the Department of Archæology and Anthropology,* National Taiwan University, no. 1 (1953), pp. 39–42; no. 2 (1953), pp. 46–49; no. 4 (1954), pp. 57–60. Sung's list covers practically every book and article relating to the subject from 1895 to March 1953, but the present supplement includes only important titles that have since appeared, without attempting to be exhaustive.

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